✲ *Farallon*® *StarCommand*™ *User's Guide*

✥ Farallon® StarCommand™ 3.1 User's Guide

Note to users of previous versions of StarCommand

StarCommand™ version 3.1 provides many new features to users of previous versions of StarCommand. Depending on which version you last used, you may notice changes in the look and feel of the product, as well. The main differences between version 3.1 and previous versions are outlined here:

For users of StarCommand version 3.0 and all previous versions:

- **Support for the Farallon Concentrator.** The Farallon Concentrator is a space-saving mounting enclosure for Farallon hubs and routers, that simplifies network wiring through the use of a built-in Ethernet backplane and built-in LocalTalk interconnection circuits. StarCommand displays Interface Modules of Farallon Concentrators in the Device List, along with your Farallon hubs and routers. You can use StarCommand to name the Interface Module, record comments about it, and reset it. The Interface Module is an extended management device, providing you with the ability to use StarCommand over AppleTalk networks, as well as over the management bus.

- **Support for the InterRoute/5™ router and the StarRouter™, Farallon's routing hub.** If you own a Farallon StarRouter or an InterRoute/5 router, StarCommand uses the new Router menu to provide you with ways to configure and manage the LocalTalk–EtherTalk routing capabilities and AppleTalk–IP gateway capabilities of these products. The StarRouter and the InterRoute/5 are also both extended management devices, providing you with the ability to use StarCommand over AppleTalk networks, as well as over the management bus.

- **Command name changes.** Several command names have been changed, in order to show that they apply to routers, gateways, and Interface Modules, as well as to repeating hubs. In most cases, the word "Hub" or the word "StarController" is simply changed to the word "Device." Exceptions are "Open StarController," which is now "Open Port List," and "Show Event Log," which is now "Show Session Event Log" (to distinguish it from "Show Router Event History," which appears in the Router menu and applies to only the selected device).

■ **New Quick Find command.** This new command allows you to quickly locate and select a specific device in the Device List, by specifying the device model and serial number.

For users of StarCommand versions 1 and 2:

■ **Redesigned user interface.** The StarCommand windows first provided in version 3.0 display additional information about the devices and ports. The Device List, which is the main window, can now show traffic totals, error totals, comments, or settings. The amount and types of information available depend the devices you have. The flexibility of the new interface is especially useful when controlling a large network because you can view and change settings for multiple devices at a glance. See Chapter 2, "StarCommand Windows," for an overview of each window.

■ **Enhanced search capabilities.** StarCommand 3.0 first provided an intelligent asynchronous communications manager that constantly searches for new devices in the background. StarCommand searches for devices attached via the management bus, and also for extended management devices via AppleTalk. For details, see "Searching for Devices" in Chapter 3.

■ **Support of extended management features.** In addition to the Concentrator Interface Module, the StarRouter, and the InterRoute/5 router described above, the StarController® 357 and 377 hubs also support extended management, can detect AppleTalk information, can be assigned a password, and can be reprogrammed. For details, see the *StarController User's Guide*.

■ **Logging of network events.** Network events, such as a jammed port or disconnected device, are posted in the Session Event Log. You can print this log or save it as a text file. This is especially useful for keeping a history of network events.

■ **Improved file format.** In addition to storing device names, the StarCommand file format now stores preferences, device passwords, settings, and window positions. See "Information Saved in a StarCommand File" in Chapter 3 for more information.

Contents

Introduction

Network managers use StarCommand™ to efficiently monitor and control Farallon hubs and routers on an AppleTalk network. The StarCommand application displays detailed information and statistics for all LocalTalk and Ethernet StarController hubs, the StarRouter (Farallon's routing hub), the InterRoute/5 router, and the Interface Module of the Farallon Concentrator. StarCommand lets you control which repeater ports and router ports will be used, and which AppleTalk–IP gateway protocols will be supported. It lets you name individual devices and record comments about them.

StarCommand simplifies network management—now and in the future. Use StarCommand along with your network map to set up, maintain, and troubleshoot a small or large network. The application's flexible, easy-to-use interface displays statistics and changeable settings for multiple devices at once. StarCommand provides features that network managers need to quickly respond to users' demands: access to devices over the network, customization of device details, password protection, event logging, and more.

StarCommand is part of Farallon's complete suite of hardware and software networking products.

System requirements

- Macintosh Plus or later model

- System 6.0.4 or later version

- AppleTalk version 49 or later version

- 768K RAM available (1,500 recommended, or 600K plus 15K per hub or router for large networks)

- Approximately 800K free disk space.

Farallon Customer Service

Farallon Computing is committed to providing its customers with reliable products and documentation, backed up with excellent technical support.

Before contacting Farallon Customer Service, look in this user's guide for a solution to your problem. Check the index for a reference to the topic of concern. More information on Farallon Customer Service and Technical Support is found in Appendix T, "Farallon Technical Support."

About this manual

This manual has four chapters, three appendixes, a glossary, and an index. Use this manual along with the user's guides for your Farallon hubs and routers. Hub and router user's guides, such as the *StarController User's Guide*, the *StarRouter User's Guide*, or the *InterRoute/5 User's Guide*, provide you with installation and configuration instructions, and are primarily useful when you first install the product. This manual, the *StarCommand 3.1 User's Guide*, provides general reference information for all StarCommand software functions, and is primarily useful during everyday operation and maintenance. If you plan to install your hub or router into a Farallon Concentrator, begin your installation process by consulting the *Farallon Concentrator Installation and Configuration Guide.*

Chapter 1, "Getting Started," lists installation instructions and includes a tutorial of basic StarCommand functions.

Chapter 2, "StarCommand Windows," describes the information and controls in each of the StarCommand windows.

Chapter 3, "Understanding StarCommand," provides an in-depth discussion of StarCommand topics.

Chapter 4, "Menu Commands," describes each menu command in detail.

Appendix A, "Statistics," defines the statistics displayed in the StarController Info and Port Info windows.

Appendix B, "Power User Tips," explains some ways to use StarCommand most efficiently.

Appendix T, "Farallon Technical Support," describes how to contact Farallon Customer Service and Technical Support, and what information to gather before you call, fax, or write.

In this manual, the term "device" is frequently used to indicate a Farallon hardware product that is compatible with StarCommand 3.1. Such devices include LocalTalk StarController hubs, Ethernet StarController hubs, StarRouters, InterRoute/5 routers, and Concentrator Interface Modules.

The term "extended management devices" refers to devices that have a node name and address and can be controlled over AppleTalk. The StarController 357 and 377 hubs are extended management devices, as are the StarRouter, the InterRoute/5 router, and the Interface Module for the Farallon Concentrator.

The term "older hubs" refers to devices that do not have an AppleTalk node name or address and are transparent to the network. The StarController 207, 307, 407, and 507 are older hubs and must be managed via the management bus. Extended management devices can relay StarCommand signals to and from older hubs on the same management bus, however, allowing *indirect* management of older hubs over AppleTalk.

Consult the glossary for definitions of other terms used throughout this manual.

StarCommand 3.1 features

The following is an overview of StarCommand features:

- **Controls and manages Farallon repeating hubs**
  Use StarCommand to turn repeater ports on and off for
  StarRouters and LocalTalk or EtherTalk StarController hubs.
  You can also change repeater port interconnect settings
  (which control a LocalTalk port's tolerance to fragments and
  jams), adjust link integrity settings (which control a 10BASE-T
  Ethernet port's link integrity test), test branch wiring on
  LocalTalk ports, and reset hubs via software control.

- **Controls and manages Farallon hardware routers**
  Use StarCommand to configure and maintain the StarRouter
  and the InterRoute/5 router from Farallon. The StarRouter is a
  LocalTalk–EtherTalk router; the InterRoute/5 is a LocalTalk–
  EtherTalk router and a LocalTalk–LocalTalk router. These
  devices can help you to manage network traffic levels and
  improve network performance. In addition, both the StarRouter
  and the InterRoute/5 optionally provide AppleTalk–IP gateway
  services. Use StarCommand to choose routing between
  different combinations of LocalTalk, EtherTalk Phase 1, and
  EtherTalk Phase 2 networks. StarCommand also allows you to
  specify AppleTalk–IP gateway protocols for your router to use,
  in order to send specially prepared AppleTalk packets over IP
  networks, send specially prepared IP packets over AppleTalk
  networks, or use IP networks to connect AppleTalk networks
  at different locations.

- **Supports the Farallon Concentrator**
  The Farallon Concentrator is a space-saving mounting
  enclosure for Farallon hubs and routers. It simplifies network
  wiring through the use of a built-in Ethernet backplane and
  built-in LocalTalk interconnection circuits. You can now use
  StarCommand to manage all hubs and routers installed in
  Farallon Concentrators, as well as the Interface Module
  installed in each Concentrator.

■ **Displays detailed device information**
StarCommand displays the name, model, and serial number
of devices. You can also show traffic and error statistics for
devices and individual ports. Choose from real-time counters
or graphs.

Extended management devices: You can also display the
AppleTalk node name and address of the device, and the node
names and addresses of the nodes attached to the device's
repeater ports.

■ **Controls devices attached directly or over AppleTalk**
StarCommand can control all devices directly attached via the
management cable to the modem or printer port of the
network manager's Macintosh.

Extended management devices: StarCommand can control
these devices through an AppleTalk connection to any
Macintosh on the network. The AppleTalk connection can be
the built-in LocalTalk port or the connector on an EtherTalk or
TokenTalk adaptor. Extended management devices also relay
commands to the management bus, so you can use AppleTalk
to control older hubs that connect to the same management
bus as an extended management device.

■ **Manages multiple devices simultaneously**
The Device List shows details and settings for many devices
at once. You can modify the view to show comments, status,
traffic or error statistics, port enable, port interconnect, or link
integrity settings. You can also sort and print the information
in the Device List. Managers of large networks will find the
variety of view options and the Quick Find command especially
useful for quickly locating devices and comparing settings
between devices.

■ **Informs you when network events occur**
StarCommand helps you manage the network by alerting you regarding jammed ports, disconnected devices, and other critical network events. StarCommand displays an alert icon alongside the device or port in question and writes a description of the alert condition in the Session Event Log. You can also have StarCommand notify you when an alert occurs by beeping or displaying the Session Event Log. StarCommand works with Apple's Notification Manager, so you can run StarCommand in the background under MultiFinder or System 7 and still receive network alerts.

■ **Add comments to identify devices and ports**
StarCommand allows you to enter comments and a name for each device and each repeater port. If you use StarCommand to enter information about the users connected to each repeater port, you can more readily identify any users who may be affected by a jammed port or other error condition.

■ **Two types of password protection**
You can assign a password to a StarController file. This file stores preferences, settings, comments, names, and more. A password keeps unauthorized users from tampering with the information in the file. Your ability to respond quickly to a network crisis may depend upon the integrity of the information in this file.

Extended management devices: You can use a password to ensure that unauthorized users do not accidentally or intentionally control extended management devices or any devices directly attached to these devices through the management bus. Once a device is password protected, a user running StarCommand over the network can view information, but only a user with the correct password can control the device.

Wiring the management bus

Before you can run StarCommand and manage devices, you need to interconnect the devices. If your hubs and routers are stand-alone devices, see the hub or router user's guides for information on how to connect devices to a management bus and terminate the bus properly. If you will be using a Farallon Concentrator, see the *Farallon Concentrator Installation and Configuration Guide* for information on using the built-in Concentrator management bus.

The illustration below summarizes device interconnection. A 207, 307, and 357 hub are interconnected by AppleTalk and the management bus, and the network manager's Macintosh is connected via the management cable. The management cable is usually plugged into the modem port on the network manager's Macintosh.

You can run StarCommand from the network manager's Macintosh and control all the devices.

Because the 357 hub is an extended management device, you can also run StarCommand from any Macintosh on the network and control all the devices over the AppleTalk connection.
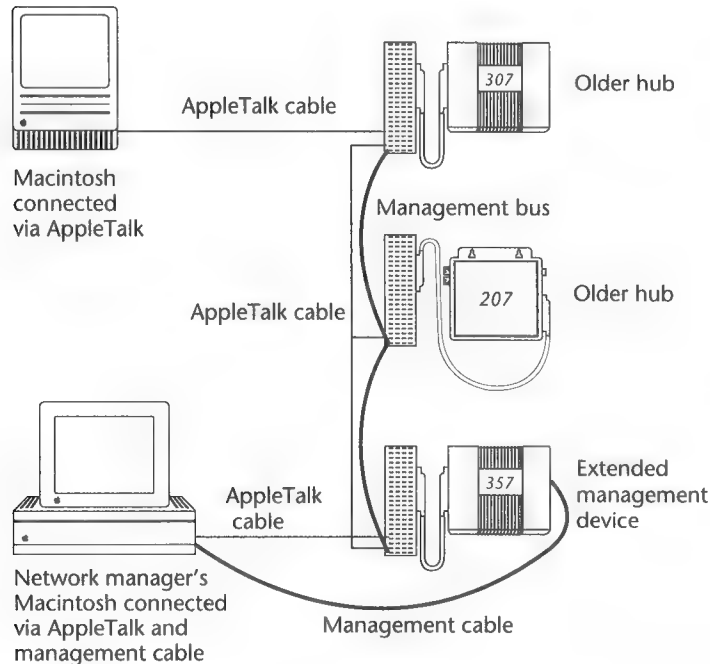
Chapter 1

Getting Started

This chapter describes how to install StarCommand and what to expect when you open the application for the first time. Also included are some common problems encountered when you first learn how to use StarCommand.

Installing StarCommand

1. Insert the StarCommand disk.

2. Copy the StarCommand application to your hard disk or a floppy disk.

Quick start

This section is designed to help the novice StarCommand user get started with the application. It describes how to open the application, display devices on the network, display detailed device information, change device names, and save the StarCommand file. Once you complete these steps, you should be ready to use StarCommand and find the specific information you need in the remaining chapters of this manual.

1. **Check your network connection.**
   Before you can use StarCommand, make sure that the Macintosh you're using to run StarCommand is connected to your Farallon hubs and routers through AppleTalk or the management bus. For details on wiring the management bus, see the user's guide for your hub or router. If you plan to control devices over AppleTalk, be sure AppleTalk is active in the Chooser.

2. **Open StarCommand and view the devices.**
   When you double-click the application icon, StarCommand creates a new, untitled StarCommand file and begins searching for devices. By default, StarCommand searches for devices on the management bus (through the modem port) and for devices on AppleTalk in your zone. In most cases, devices appear a few seconds after the Device List opens. For large or very busy networks, some devices may take a few minutes to appear.

   It's a good idea to choose Set Preferences from the File menu and check to see which search options are currently selected. The options listed under Communicate With Devices Via control which connections StarCommand uses to search for devices. Be sure to turn off the connections that do not apply to you.

The connections you select determine where StarCommand searches for devices.

If you select the AppleTalk connection, you can choose which zones to search. (Shift-click for multiple selections.)

StarCommand Preferences

Communicate with devices via:

⊠ AppleTalk (Over the Net)
⊠ Modem Port (Mgmt Cable)
☐ Printer Port (Mgmt Cable)

Alert by:

☐ Beeping
☐ Opening Session Event Log
☐ Flashing Icon when Running in Background

AppleTalk Zones to Search:

4th Floor
5th Floor
6th Floor
Cleveland
Demo Room
Ethereal World
GatorZone
Kansas
KS EtherTalk

[Search All Zones]

[Save Defaults] [Use Defaults]   [Cancel] [OK]
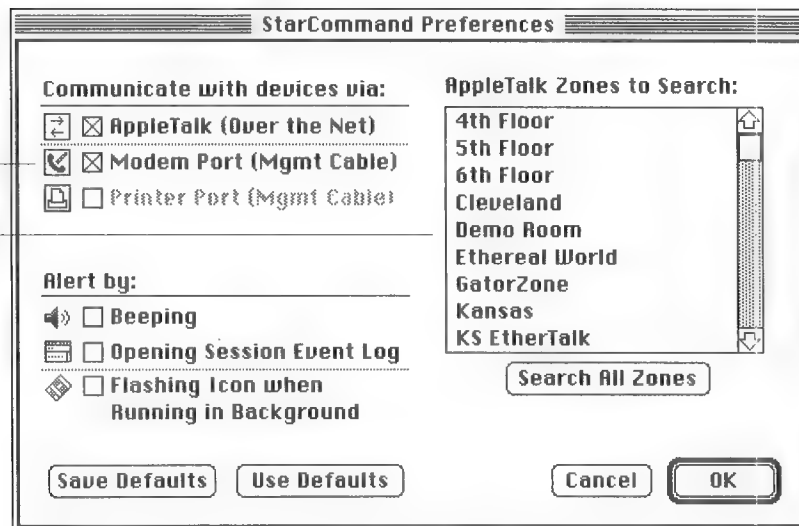
If no devices appear after you select the appropriate search options, see "Problems Encountered When Learning StarCommand," later in this chapter.

3. **Use the pop-up menu to display information and settings.**
   The Device List has a pop-up menu that lets you show different information and settings. Try selecting each option in the pop-up menu.

The pop-up menu lets you show information or settings for all devices at the same time.

Untitled

Farallon

Total 4	Name, Model, and Serial Number		Traffic	Errors

Comments
Status
✓ Enables
Interconnects
Link Integ. Enables

Repeater Traffic (Bytes)
Repeater Errors

4th Floor North
PN377 StarController
09-20329

10 11 12

Hal's Hub
PN357 StarController
09-13021

1 2 3 4 5 6 7 8 9 10 11 12
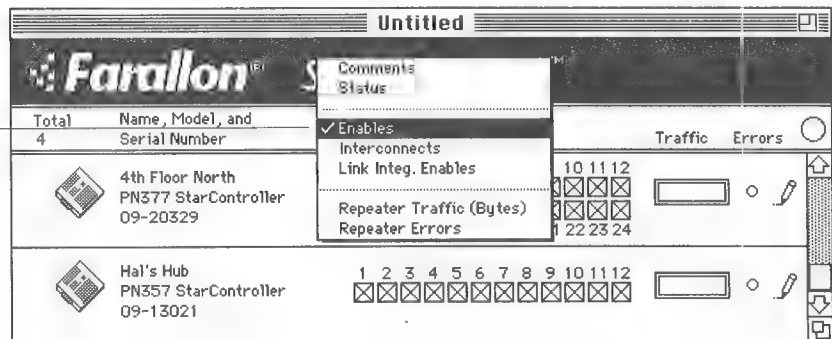
4.   **Open the Port List.**
The Port List shows information and settings for the repeater ports of any selected repeating device. Double-click the device icon in the Device List to display the Port List.

Double-click a hub icon
to display the Port List

Untitled

Hal's Hub

Hal's Hub
PN357 StarController
09-13021
Firmware Version 1.0

Repeater Traffic %

Status: OK

Last 2 minutes   Last 10 seconds

	Port Name	Traffic (Bytes) ▼		Enables ▼	Traffic	Errors
1	Port 1	12,376	4.0%	⊠		○
2	Port 2	0	0.0%	⊠		○
3	Port 3	0	0.0%	⊠		○
4	Port 4	0	0.0%	⊠		○
5	test port	157,392	58.6%	⊠		○
6	Port 6	0	0.0%	⊠		○
7	Port 7	0	0.0%	⊠		○
8	Port 8	0	0.0%	⊠		○
9	Port 9	0	0.0%	⊠		○
10	Port 10	0	0.0%	⊠		○
11	Port 11	0	0.0%	⊠		○
12	<unnamed>	3,512	0.0%	⊠		○
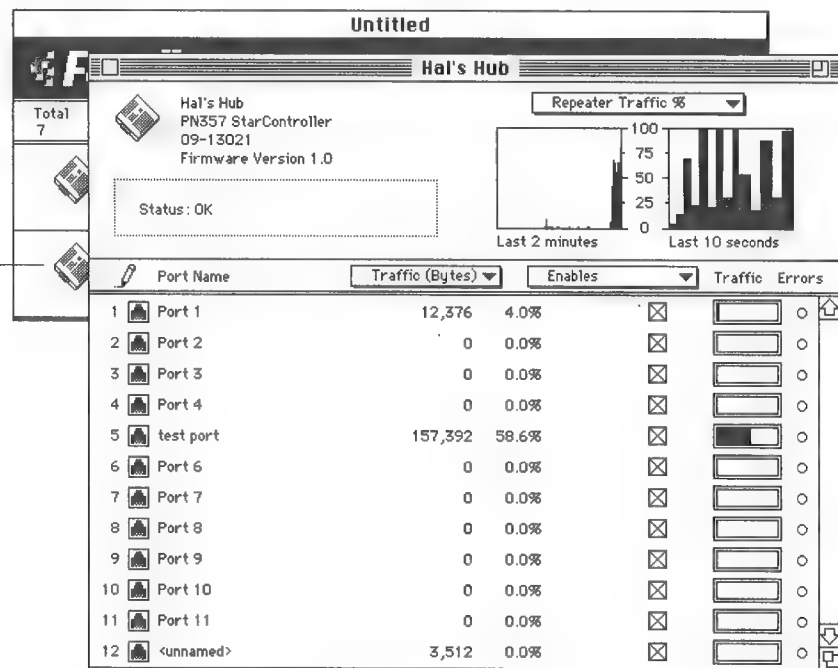
5.   **Change a port name.**
Entering a descriptive port name helps you identify users and workstations in the future. To type in a new name, click the old name and begin typing. Extended management hubs automatically use names of AppleTalk nodes that are connected to the repeater ports as port names.

To change the port name, click it and type in a new name

	Port Name	Traffic (Bytes) ▼		Enables ▼	Traffic	Errors
1	My computer	72,456	1.7%	⊠		○
2	Port 2	0	0.0%	⊠		○
3	Port 3	0	0.0%	⊠		○
4	Port 4	0	0.0%	⊠		○
5	test port	1,495,448	46.0%	⊠		○
6	Port 6	0	0.0%	⊠		○
7	Port 7	0	0.0%	⊠		○
8	Port 8	0	0.0%	⊠		○
9	Port 9	0	0.0%	⊠		○
10	Port 10	0	0.0%	⊠		○
11	Port 11	0	0.0%	⊠		○
12	<unnamed>	3,512	0.0%	⊠		○

Hal's Hub

Hal's Hub
PN357 StarController
09-13021
Firmware Version 1.0

Status: OK

Repeater Traffic %

Last 2 minutes   Last 10 seconds
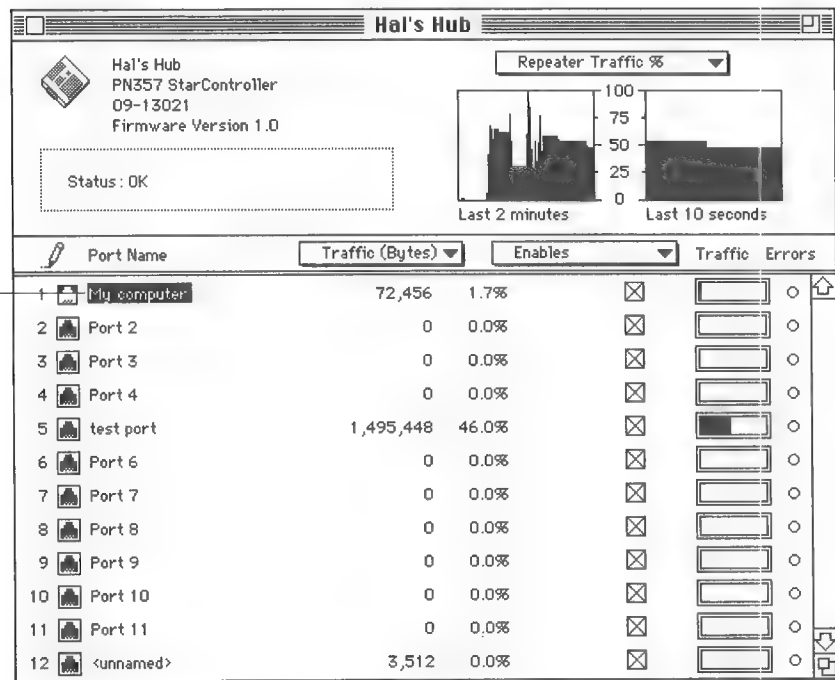
▶ **Note:** Port Lists are available for devices that have repeating ports, such as LocalTalk or EtherTalk StarController hubs or StarRouters. To completely configure a StarRouter or InterRoute/5 router, however, you must use additional commands that can be found in the Router menu. For information on the commands in the Router menu, see Chapter 4. For detailed configuration instructions, see the user's guide for your router.

6. **Save the StarCommand file.**
   StarCommand files save your preference settings, device names, port names, comments, device sort order, window sizes and positions, and extended management device passwords. To save a StarCommand file, choose Save from the File menu. The standard directory dialog box appears. Name the file, choose a destination directory, and click Save.

Problems encountered when learning StarCommand

Problem: The Device List remains blank and no devices appear after opening StarCommand.

Solution: Any of the following solutions may apply to your situation:

■ The AppleTalk wiring or management cable is not attached to your Macintosh. See "Wiring the Management Bus" in the Introduction for an overview, and see your hub or router user's guide for details.

■ The communications settings in the Preferences dialog box are incorrect. Choose Set Preferences from the File menu to change the settings. If you have a management cable attached to the modem or printer port on your Macintosh computer, select that port. If you do not have a management cable attached to your Macintosh computer, select AppleTalk and the zones that contain your extended management devices. You must either have at least one extended management device, or you must use a management cable to connect your Macintosh to the management bus.

■ Searching is not active. If the search indicator in the upper right corner of the Device List does not rotate, choose Searching On from the Control menu.

Problem: The AppleTalk checkbox is dimmed in the Preferences dialog box.

Solution: AppleTalk is switched off for the Macintosh.

■ **For Macintosh computers running System 7:** Quit StarCommand, open the Chooser, select the AppleTalk radio button for Active On Restart, restart your Macintosh, and reopen StarCommand.

■ **For Macintosh computers running earlier System versions:** Quit StarCommand, open the Chooser, switch AppleTalk to active, and reopen StarCommand.

Problem: It is difficult to locate a device in the Device List as most are named "Unnamed *x*".

Solution: Look on the molded plastic case or Concentrator front panel of each device to find its serial number. Select Quick Find from the Control menu, choose the device type from the pop-up menu, type in the serial number, and click the Find button. StarCommand automatically highlights the correct device in the Device List. For easy identification in the future, type in a descriptive device name for each device, such as "5th Floor Master Hub," and save the StarCommand file.

Problem: You cannot change the settings for a particular device.

Solution: The device is password protected or is directly attached to an extended management device that is password protected. Select the device, choose Enter Password from the Control menu, and type in the correct password.

Problem: The Device List constantly re-sorts.

Solution: StarCommand re-sorts the Device List every time it locates a new device. Select Unsorted from the View menu to direct StarCommand to add new devices to the end of the Device List. Or you can deselect Searching On from the Control menu to stop searching for new devices.

Problem: The Session Event Log constantly reopens.

Solution: StarCommand is receiving network alerts and automatically displaying the Session Event Log. Select Set Preferences from the File menu and deselect the Alert By Opening Event Log option. Network events will still be posted and you can view them at any time by choosing Show Session Event Log from the File menu.

Problem: The names and comments you entered during a previous StarCommand session no longer appear.

Solution: Perhaps you forgot to save the StarCommand file during the previous session, or you didn't reopen the StarCommand file during the current session. In addition to storing device names, port names, and comments, the StarCommand file stores preferences, sort order, passwords, and window sizes and positions. It's a good idea to save the StarCommand file whenever you make changes to it.

Problem: Response time is slow when controlling devices over AppleTalk.

Solution: Network traffic is heavy. Consider reconfiguring the network with additional routers to reduce traffic on any single network. If possible, run StarCommand over the management bus.

Problem: Response time is slow, some devices do not appear in the device list, device settings change without warning, or devices do not operate properly.

Solution: Two people may be using StarCommand simultaneously, from different Macintosh computers. Run only one StarCommand session at a time.

This is the end of the quick start. The next chapter describes each of the StarCommand windows.

Chapter 2

StarCommand Windows

This chapter describes the seven most important windows in StarCommand. You can quickly learn about the StarCommand features by reviewing the windows.

The following windows are described:

- Device List

- Port List

- Device Info window

- Port Info window

- Session Event Log

- Router Event History

- Routing Table.

Device List

The Device List is one of the most important windows in StarCommand. It displays a list of the devices on the network, including LocalTalk and EtherTalk StarController hubs, StarRouters, InterRoute/5 routers, and Farallon Concentrator Interface Modules. You can also display detailed information about these devices and change some settings from the Device List.

StarCommand searches for devices through the connections selected in the Preferences dialog box. With searching enabled, devices appear in the list as StarCommand finds them.

Device name
This user-defined name helps you identify devices in the Device List. You can change a name by clicking it and typing a new name. This name is stored in the StarCommand file and is for your reference. Extended management devices also store the device name in firmware.

Device model and serial number
The model indicates the type of router, hub, or other device. The serial number shown matches the serial number on the device, except on StarController 207 hubs, where the serial number is the decimal equivalent of the DIP switch setting for the hexadecimal management address.

Search indicator
This indicator rotates when searching is in progress.

Alert icon
An icon appears alongside a device should a network event occur, such as port jamming. Details of the event are saved in the Session Event Log. **Shortcut:** Double-click the alert icon to display the Session Event Log.

Error indicator
This indicator fills in when an error occurs on any repeater port of the device.

Pencil icon
This icon indicates that the device is password protected. A pencil with no slash indicates that you can control the device. A pencil with a slash indicates that the device has a read-only status. **Shortcut:** Double-click the pencil icon to display the password dialog box.

Device icon
An icon representing each device appears in the list. **Shortcut:** Double-click a device icon to display the Port List for hubs or the Device Info window for non-repeaters.

Pop-up menu
By default, this portion of the window shows repeater port enable settings for each device. Use the pop-up menu to display comments, status, traffic, or errors, or checkboxes for the port interconnect or link integrity settings.

Traffic rate
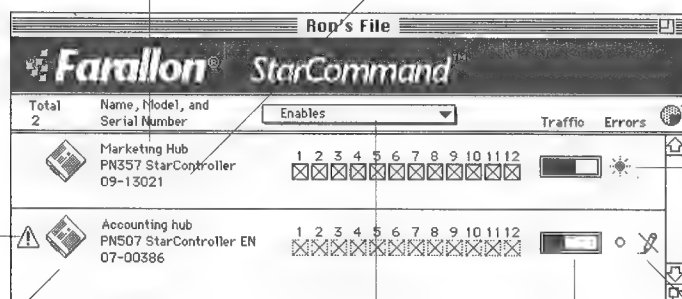A graphic representation of repeater traffic for the device as a percentage of total network capacity.

Pop-up menu

```
Comments
Status
..................................................
✓ Enables
Interconnects
Link Integ. Enables
..................................................
Repeater Traffic (Bytes)
Repeater Errors
```

Comments
Displays a portion of comments that have been entered for the devices. To view all comments for a device or to change the comments, open the Device Info window by selecting a device and choosing Device Info from the Control menu.

Status
Shows the current device status, for example, "OK," "Port Jam," or "Disconnect." Additional details about an alert status appear in the Session Event Log.

Enables
Displays checkboxes to switch repeater ports on and off. A check indicates that a port is switched on. Click a checkbox to toggle a port on or off. This setting applies to StarController 207, 307, 357, 377, 407, and 507 hubs, and to StarRouters.

Interconnects
Displays checkboxes to switch port interconnect settings on and off. This setting is used for ports that are connected to other Farallon repeater ports, rather than to AppleTalk nodes. Technically, this setting controls a LocalTalk port's tolerance to fragments and jams. This setting applies to 307, 357, and 377 hubs and to StarRouters. See the *StarController User's Guide* or the *StarRouter User's Guide* for more information about the port interconnect setting.

Link Integrity Enables
Displays checkboxes to switch link integrity settings on and off. This setting controls a 10BASE-T Ethernet port's link integrity test. This setting applies to 507 hubs only. See the *StarController EN User's Guide* for more information about the link integrity setting.

Repeater Traffic (Bytes)
Displays total repeater traffic in bytes and total repeater traffic as a percentage of the total bandwidth of the network.

Repeater Errors
Displays the total number of errors detected by the repeater.

Port List

This window appears when you select a StarController hub or StarRouter in the Device List and select Open Port List from the Control menu. You can also display this window by double-clicking the icon for a repeating device in the Device List.

Status
Shows the current device status, for example, "OK," "Port Jam," "Off Line," or "Disconnect."

Window header
Shortcut: Double-click anywhere in the window header to display the Device Info window.

Traffic or error percentage graph
Displays a graphical representation over time of number of errors per second or of hub traffic expressed as a percentage of the total capacity of the hub's network. Use the pop-up menu to select either traffic or errors. LocalTalk hubs display information on a linear scale, while Ethernet hubs display information on a logarithmic scale.

Port number and icon
**Shortcut:** Double-click the icon to show the Port Info window containing details and statistics.

Alert icon
An icon appears over a port number should a network event occur, such as a port jamming.
Shortcut: Double-click the alert icon to display the Session Event Log.

Port name
This user-defined name helps you identify ports in the Port List. You can change the name by clicking it and typing in a new name.
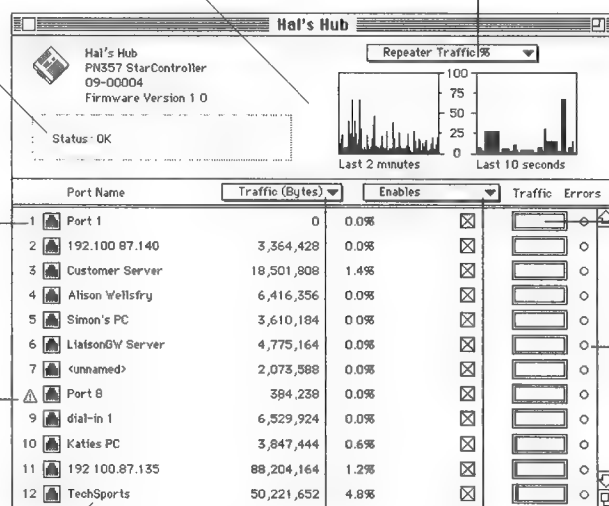
Traffic rate
A graphic representation of traffic on this port as a percentage of the traffic capacity of the hub's network.

Error indicator
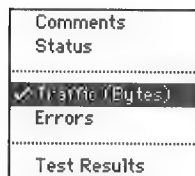This indicator fills in when an error occurs on the port.

Information pop-up menu
Use the pop-up menu to display comments, status, test results, port traffic statistics, or errors. Traffic statistics are shown in bytes and as percentages of the traffic capacity of the hub's network.

Settings pop-up menu
This column shows port enable settings for each port. Use the pop-up menu to display checkboxes for the port interconnect or link integrity settings.

	Port Name	Traffic (Bytes) ▼		Enables ▼	Traffic	Errors
1	Port 1	0	0.0%	☒		o
2	192.100.87.140	3,364,428	0.0%	☒		o
3	Customer Server	18,501,808	1.4%	☒		o
4	Alison Wellsfry	6,416,356	0.0%	☒		o
5	Simon's PC	3,610,184	0.0%	☒		o
6	LiaisonGW Server	4,775,164	0.0%	☒		o
7	<unnamed>	2,073,588	0.0%	☒		o
⚠	Port 8	384,238	0.0%	☒		o
9	dial-in 1	6,529,924	0.0%	☒		o
10	Katies PC	3,847,444	0.6%	☒		o
11	192 100.87.135	88,204,164	1.2%	☒		o
12	TechSports	50,221,652	4.8%	☒		o

Hal's Hub
PN357 StarController
09-00004
Firmware Version 1 0

Status: OK

Repeater Traffic %
100
75
50
25
0
Last 2 minutes   Last 10 seconds

Pop-up menus

Comments
Status
✓ Traffic (Bytes)
Errors
Test Results

Comments

Displays one line of comments for each repeater port. To view more comment lines or change a comment, select a port icon and open the Port Info window.

Status

Shows the current device status, for example, "OK," "Port Jam," "Off Line," or "Disconnect." See the Session Event Log for details about an alert status.

Traffic (Bytes)

Displays repeater port traffic in bytes and repeater port traffic as a percentage of total network capacity.

Errors

Displays the error counters for the repeater ports, and the amount of errors as a percentage of total traffic.

Test Results

Displays results of line tests for repeater ports on 207, 307, 357, and 377 hubs or StarRouters. StarCommand automatically changes to this menu option after you initiate a test on one or more ports.

✓ Enables
Interconnects
Link Integ. Enables

Enables

Displays checkboxes to switch repeater ports on and off. A checkmark indicates that a port is switched on. Click a checkbox to toggle a port on or off.

Interconnects

Displays checkboxes to switch LocalTalk repeater port interconnect settings on and off. This setting controls a LocalTalk port's tolerance to fragments and jams. A check indicates that port interconnect is on. This setting applies to 307, 357, and 377 hubs and to StarRouters only. See the *StarController User's Guide* or the *StarRouter User's Guide* for more information about the port interconnect setting.

Link Integrity Enables

Displays checkboxes to switch link integrity settings on and off. This setting controls a 10BASE-T Ethernet port's link integrity test. A checkmark indicates that link integrity is switched on. This setting applies to StarController EN (507) hubs only. See the *StarController EN User's Guide* for more information about link integrity settings.

Device Info window

The Device Info window shows statistics and comments for a device.

This window is displayed by selecting a device in the Device List and then selecting Device Info from the Control menu. The exact contents of the window vary depending upon the type of device displayed. You can scroll the fields in the window, or drag the split bars up or down to change the size of portions of the window. You can also display this window by double-clicking on the device icon in certain windows.

Status

Shows the current device status, for example, "OK," "Port Jam," or "Disconnect."

```
▤▯▤▤▤  Device Info  ▤▤▤
       Hal's Hub
       PN357 StarController
       09-00004
       Firmware Version 1.0
 Status: OK
 Statistics:
 LT Repeater Traffic (Bytes):     16,080  ⬆
 LT Repeater Traffic (Packets):    5,356
 LT Total Errors:                      0
 LT Mgmt Traffic (Bytes):          8,040
 LT Mgmt Traffic (Packets):        2,678  ⬇
 Network Information:                     ⬍
   Name:    Hal's Hub
   Type:    StarController 357
   Zone:    5th Floor
   Address: 4.25.254
 Comments:                               ⬍
 Located in the 4th floor wiring closet  ⬆
                                         ⬇
```

Device name, model, serial number, and firmware version

Statistics

Displays total traffic and error figures for the device. The fields vary depending upon the type of device displayed. The counters may initially appear as "Pending" as StarCommand polls the device for statistics. The fields vary depending on the type of device. For more information on statistics, see Appendix A.

AppleTalk information (Extended management devices only)

Shows the network name, type, zone, and address for the device. If StarCommand has not established AppleTalk communications with the device, StarCommand displays the address as 0.0.0.

Comments

You can type in up to 1024 characters.

Port Info window

The Port Info window shows statistics and comments for each repeater port.

This window is displayed by selecting a port in the Port List and selecting Port Info from the Control menu, or by double-clicking a port icon. The exact contents of the window vary depending upon the type of device displayed. You can scroll the fields in the window or drag the split bars up or down to change the size of portions of the window.

Status
Shows the current device status, for example, "OK," "Port Jam," or "Disconnect."

Port name, port number, device name, and serial number

Statistics
Displays traffic and error figures for the port. The fields vary depending upon the type of device displayed. The counters may initially appear as "Pending" as StarCommand polls the device for statistics. The 207 and 407 hubs do not have any individual port statistics. For more information on statistics, see Appendix A.

AppleTalk information (Extended management devices only)
Shows the node name and number for every device attached to the port.

Comments
You can type in up to 1024 characters.
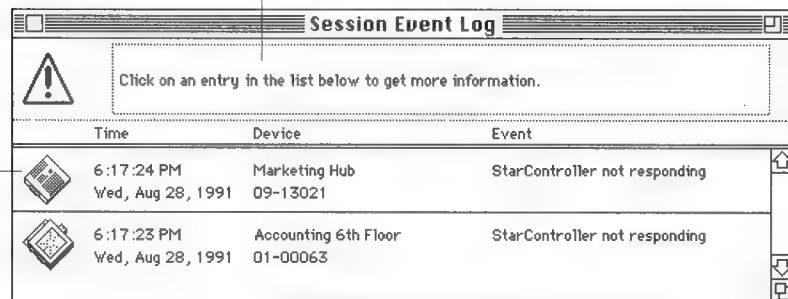
Session Event Log

The Session Event Log records network events that have occurred while running StarCommand. For example, an entry is posted when a repeater port jams, when a device is no longer responding, or when a device has been reset. An entry is also posted when you test a repeater port's line quality. The Session Event Log records events for all devices in the device list, unlike the Router Event History, discussed later in this chapter, which records information that is specific to the individual device selected. This command appears in the File menu.

Help text
Select an alert entry to display additional information about the alert.

Alert entries
Entries include an event description, date, time, device serial number, port number, test results, and other details.

	Session Event Log	
Click on an entry in the list below to get more information.		

Time	Device	Event
6:17:24 PM Wed, Aug 28, 1991	Marketing Hub 09-13021	StarController not responding
6:17:23 PM Wed, Aug 28, 1991	Accounting 6th Floor 01-00063	StarController not responding

Router Event History

The Router Event History is available only for Farallon hardware routers, such as the StarRouter and the InterRoute/5 router. Each of these devices keeps track of the last 128 network events that directly affected it, such as warm boots, cold boots, and reprogramming of Flash-EPROMs. The Router Event History command displays this information for the device that is selected in the Device List. This command appears in the Router menu.
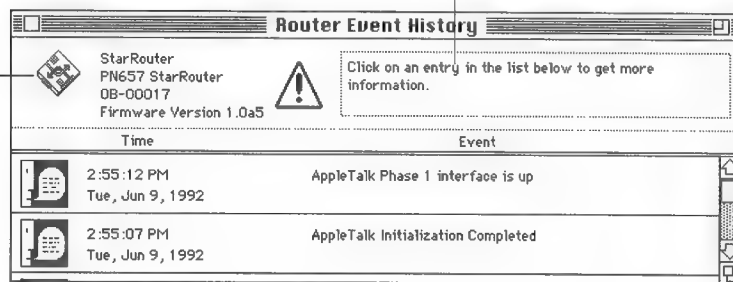
Help text
Select an alert entry to display additional information about the router event.

Selected Router
Displays name, device type, serial number, and firmware version.

Event entries
Entries include an event description and a date and time.

Router Event History	
StarRouter PN657 StarRouter 0B-00017 Firmware Version 1.0a5 ⚠	Click on an entry in the list below to get more information.
Time	**Event**
2:55:12 PM Tue, Jun 9, 1992	AppleTalk Phase 1 interface is up
2:55:07 PM Tue, Jun 9, 1992	AppleTalk Initialization Completed

Routing Table

The Routing Table shows AppleTalk routing information for all the AppleTalk networks on your internet, including IPTalk networks. Each row of the routing table represents one network. The Routing Table window also shows statistics related to AppleTalk routing.

The Routing Table window is available only for internets that contain at least one Farallon hardware router, such as a StarRouter or InterRoute/5 router. To display this window, select a router in the Device List, and choose Show Routing Table from the Router menu.

Statistics ——————————

Selected Router ——————————

Information about ———————— individual networks

Routing Table

StarRouter
PN657 StarRouter
OB-00017
Firmware Version 1.0a5

BrRqs In = 60	LkUps Out = 90	
Rtmp/Zips = 296	Pkts Frwd = 0	
Rx Errors = 0	Tx Errors = 0	
No Buffer = 0	Inval Prt = 0	
HopOvrFlo = 0	Inval Net = 0	
Bad Cksum = 0	Filtered = 0	

Save...
Clear

						Cumulative Traffic Received as of 11:51 AM 6/8/92	
Zone Name	Net Number	State	Hops	Router Port	Net.Node Number	Percent	Packets
EtherTalk Phase 2	20	Good	0	ET Ph.2	20.150	0	0
LocalTalk 1	1001	Good	1	ET Ph.2	20.151	0	0
LocalTalk 2	1002	Good	1	ET Ph.2	20.151	0	0
LocalTalk 3	1003	Good	1	ET Ph.2	20.151	0	0
LocalTalk 4	1004	Good	1	ET Ph.2	20.151	0	0
LocalTalk StarRtr	59372	Good	0	LT	59372.128	100	6

Statistics

Shows statistics related to AppleTalk routing and gateway services. For more information on statistics, see Appendix A.

Save

Saves statistics and routing table information to a tab-delimited text file.

Clear

Sets all routing statistics displayed in the Routing Table window to zero.

Zone Name

Shows the zone name associated with each LocalTalk, EtherTalk Phase 1, or IPTalk network. For EtherTalk Phase 2 networks or TokenTalk networks with multiple zones, the zone name displayed is the name of the default zone.

Net Number

Shows the AppleTalk network number or range of numbers configured for each network.

State

Gives a qualitative indication of how recently the selected router has received router information packets from the indicated network. "Good" indicates recent traffic, "Suspect" indicates that there may be communications problems with the indicated network, and "Bad" indicates a definite communications problem.

Hops

Indicates how many additional routers packets must pass through to travel from the selected router to the indicated network.

Router Port

Indicates which one of the selected router's ports is used to communicate with the indicated network.

Net.Node Number

Indicates the router port address to use when transmitting to each network listed in the left-hand column.

- For a network that is connected to the selected device (hops equal to 0), Net.Node Number indicates the network number and node number of the device's own router port on that network.

- For a network that is not directly connected to the selected device (hops equal to 1 or greater), Net.Node Number indicates the port address of the next router that should receive any packet that is destined for the indicated network.

Cumulative Traffic

Indicates the amount of traffic the selected device has received from the indicated network, expressed both as packets and as a percentage of total traffic.

Chapter 3

Understanding StarCommand

This chapter describes StarCommand concepts in detail. It also references many of the commands that are documented individually in Chapter 4, "Menu Commands." This chapter is useful to new StarCommand users or to users who want more details about how StarCommand operates. The topics are broken down into these categories:
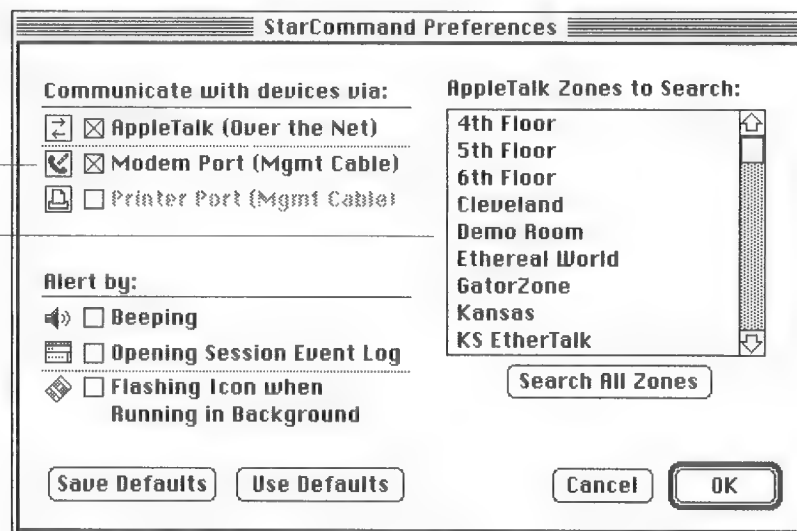
- Searching for devices

- Displaying data in the Device List

- Information saved in a StarCommand file

- Adding names and comments to a StarCommand file

- Password protecting extended management devices

- Extended management devices

- Recording network events in the Session Event Log

- About statistics

- Omitting devices from a StarCommand file.

Searching for devices

StarCommand can search for devices connected through AppleTalk
or the management bus. The Set Preferences dialog box lets you
specify which connections to use to search for devices. You can
select one or both serial ports (modem and printer ports) if you
have a management cable directly attached to a serial port. You
can select AppleTalk if your Macintosh is connected to an
AppleTalk network and you would like to control devices over the
network. You can select both AppleTalk and the serial ports;
StarCommand can search for devices through multiple connections
simultaneously. Should StarCommand detect two or more paths to
the same device, it uses either path.

The connections you select
determine where StarCommand
searches for devices.

If you select the AppleTalk
connection, you can choose
which zones to search.
(Shift-click for multiple
selections.)

StarCommand Preferences

Communicate with devices via:

☒ AppleTalk (Over the Net)
☒ Modem Port (Mgmt Cable)
☐ Printer Port (Mgmt Cable)

Alert by:

☐ Beeping
☐ Opening Session Event Log
☐ Flashing Icon when
   Running in Background

AppleTalk Zones to Search:

4th Floor
5th Floor
6th Floor
Cleveland
Demo Room
Ethereal World
GatorZone
Kansas
KS EtherTalk

[Search All Zones]

[Save Defaults] [Use Defaults]   [Cancel] [OK]

Once you have selected the connections to use for searching the
network, StarCommand begins looking for devices whenever
Searching On is selected. The search indicator in the upper right
corner of the Device List rotates to confirm that searching is in
progress.

For more information on management wiring, see "Wiring the
Management Bus" in the Introduction to this manual, and consult
the user's guides for your Farallon hubs and routers.

***Related commands:*** Set Preferences, Searching On.

Displaying data in the Device List

The Device List can display detailed information for multiple devices at the same time. Once StarCommand locates a device, it displays the model number, serial number, and a name for the device. You can use the pop-up menu to show comments, status, repeater traffic totals, or error totals, or change the repeater port enable, repeater port interconnect, or link integrity settings for the devices that use these settings. You don't need to open the Port List to access the repeater port settings.

If you have a large number of devices on the network, you can display a condensed view, showing even more devices at the same time.

You can sort the devices by name, serial number, model, or status, making it easier to locate a particular device.

The pop-up menu lets you show information or settings for all devices at the same time.
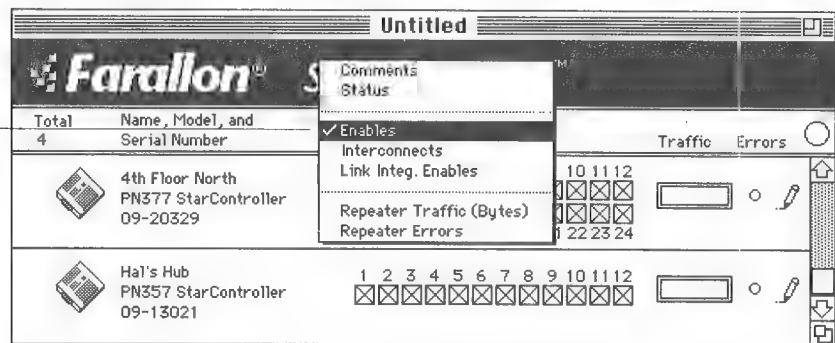
Related commands: New, Open, Expanded View, Condensed View, Sort Commands.

Information saved in a StarCommand file

The StarCommand file stores many different types of information, including:

■ Names for devices and repeater ports

■ Comments about devices and repeater ports

■ Notification and search path preferences

■ Sort order

■ Window positions

■ Window sizes

■ Passwords for extended management devices.

It's a good idea to save the StarCommand file whenever you make changes to it.

Related commands: Open, Close, Quit, Save, Save As.

Adding names and comments to a StarCommand file

Adding names and comments to a StarCommand file helps you identify devices and ports on the network. Your network map should contain detailed information about device names, locations, and workgroups, along with port numbers, the names of workstations attached to ports, and so on. You can enter most of these details directly into the StarCommand file. A well-documented StarCommand file makes network management easier, especially for a large network.

When you create a new, untitled StarCommand file, StarCommand assigns default names to the devices that appear in the Device List. The default device name is "Unnamed x," where "x" is a positive whole number. For older hubs, these default names will be displayed until you change them. For extended management devices, which can store their own device names, the default names appear only momentarily, while StarCommand copies the current hub, Concentrator, or router name from device memory into the Device Name field of the StarCommand file.

You can enter device names for all devices in the Device List, to identify the physical location of a device ("4th Floor") or the name of the workgroup attached to device ("Marketing"). When you enter a device name for an extended management device, the name is stored on the device itself. If you save your StarCommand file, device names are also stored in the file. Device names for older hubs are stored only in the StarCommand file. When you open a StarCommand file that contains saved device names, the names that were saved with the file are always the names that are displayed, even if other StarCommand files use different names, or different names were later stored on extended management devices.

You can enter device comments in the Device Info window. These can include descriptions or notes to supplement device names.

When you create a new, untitled StarCommand file, StarCommand also assigns default names to the repeater ports. The default port name is "Port x," where "x" is a number from 1 to 24. For older hubs, these default names will be displayed until you change them. For extended management devices, these default names appear only momentarily, while StarCommand gathers information about the AppleTalk nodes using the repeater ports and copies their AppleTalk node names into the Port Name field of the Port List. These node names may be the User Name, Owner Name, or other AppleTalk name assigned to the computer, printer, or other device. If multiple nodes are attached to a repeater port, StarCommand copies only one node name into each Port Name field. This name is the node name that would appear last in an alphabetical list.

You can enter port names in the Port List to identify the location of network wiring or the name assigned to the AppleTalk node attached to the port. If you save your StarCommand file, the port names you enter will be stored in the file. When you open a StarCommand file that contains saved port names, the names that were saved with the file are always the names that are displayed. This is the case even if other StarCommand files use different names, or if the AppleTalk nodes themselves have changed their names. To have StarCommand use the most current AppleTalk node names available, use the Update Port Names command.

Repeater port comments are entered in the Port Info window and can include descriptions or notes to supplement port names, such as the information needed to trace the wires to the port.

▶ **Important:** Remember to save the StarCommand file whenever you make changes to names or comments. It is also a good idea to periodically make a copy of the StarCommand file as a backup.

Related commands: Open Port List, Device Info, Update Port Names, Port Info.

Password protecting extended management devices

The device password feature helps you keep unauthorized users from accidentally or intentionally disrupting the network. Device passwords restrict access to device controls and settings whenever StarCommand is being run over an AppleTalk network. Device controls include resetting a single device, changing the node name, resetting the statistics, testing ports, and reprogramming a device. Device settings include repeater port interconnect settings, repeater port enable settings, link integrity settings, and all router configuration settings. (If the user does not have read-write access to a selected router, the configuration commands in the Router menu are dimmed, preventing the user from viewing router configuration settings.)

Device passwords do not affect any user's ability to view repeater information, routing tables, session event logs, or router event histories.

▶ **Note:** StarCommand uses device passwords only to restrict control commands and setting changes that are to be sent over AppleTalk networks. Management bus traffic is not affected by device passwords.

Device password planning

Effectively restricting access to device controls and settings depends on restricting access to the management bus. StarCommand signals that travel over the management bus can change the controls or settings of a device even if the StarCommand user does not have the correct device password. There are two methods of transmitting StarCommand signals to the management bus:

■ Through a management cable

■ Through an AppleTalk connection to a management gateway.

Both methods are discussed in the following paragraphs, along with recommendations for ensuring that device controls and settings are changed only by authorized users.

- **Management cable connection**. A management cable may connect the network manager's Macintosh directly to the management port of a hub, router, or Interface Module. If StarCommand is set to communicate via the management cable but not AppleTalk, all devices that are connected to the management bus behave as though they were set for read/write access. Thus, with a management cable connection, a StarCommand user can change controls and settings of any devices that are connected to the management bus, even if he or she does not know the correct device passwords.

  To prevent unauthorized users from changing to controls and settings via management cable connections, restrict access to any Macintosh directly connected to the management port of a hub, router, or Interface Module. Remember to restrict both physical access and electronic access through screen-sharing software.

- **AppleTalk connection to a management gateway.** The StarCommand Set Preferences dialog box allows you to communicate with devices via the management cable, AppleTalk, or both. If you enable communication via AppleTalk, you have a choice of which zones StarCommand will search in when looking for devices.

  Whenever StarCommand finds an extended management device through an AppleTalk connection, that device can be used as a management gateway. This means that it can relay StarCommand signals between AppleTalk and the management bus. To prevent unauthorized changes to controls and settings, make sure that every extended management device in your internet has a device password.

If an extended management device acting as a management gateway has no device password, or if the user enters the correct password for that device, StarCommand transmits all signals to the management gateway, which forwards the signals to the management bus. This provides the user with read/write access to the controls and settings of all devices that StarCommand has found over the management bus.

If the user does not enter the correct password for a management gateway, StarCommand will not send control commands or settings changes over AppleTalk.

Depending on your network layout, traffic, and StarCommand preferences, different devices may serve as management gateways at different times. This is because after the first extended management device is found over AppleTalk, other extended management devices may be found either over AppleTalk or over the management bus. If they are found over AppleTalk, they can serve as management gateways for that session. If they are found over the management bus, they cannot.

To gain read/write access to any device found through a management gateway, you must enter the password of the management gateway, even if the gateway is not the device you wish to control. Since a management gateway has no special appearance in the Device List, you may need to find the correct password by experimenting. If your security requirements allow it, Farallon recommends that you give all your extended management devices the same device password, in order to simplify password use.

Installing a device password

To install a device password, select an extended management device in the Device List, then choose the Set Password command from the Control menu. Enter a password up to eight characters long. The device password mechanism is case-sensitive, so be sure you know whether each character in the password is uppercase or lowercase. Device passwords are stored in a one-way encrypted format. Passwords are protected from curious users running network analyzers.

Once you have password protected a device, an icon appears alongside the entry indicating the read/write status. Another user of StarCommand that doesn't know the password sees an icon indicating read-only status.

Device password protected with read-write status

Device not password protected

Device password protected with read-only status

Working with existing device passwords

Here are some additional details about passwords:

■ When you first install a device password, you retain read/write access to controls and settings as long as the current StarCommand file remains open. Once you open a different StarCommand file or create a new one, you must enter the password to gain read/write access.

■ The currently open StarCommand file remembers which password-protected devices you have unlocked as well as the exact passwords you entered. Always try to save the currently open StarCommand file after you enter a password. The next time you reopen the StarCommand file, the devices will be unlocked and will allow read/write access automatically. This automatic unlocking feature gives the network manager quick access to change controls and settings for all devices without having to manually reenter multiple passwords every time the same StarCommand file is reopened.

■ A device remains password protected after you enter the correct password, unless you remove the password.

■ Any user running StarCommand can change the password for an extended management device if they know the old password, whether they are connected through AppleTalk or the management bus.

Related commands: Set Password, Change Password.

Extended management devices

Extended management devices (such as the 357 and 377 hubs, the Concentrator Interface Module, the StarRouter, and the InterRoute/5 router) support more commands and can display more information than older hubs:

Port Info window: Displays the node name, node number, and network number for each of the devices attached to the repeater port.

Reprogram Device command: Downloads a firmware program file from your Macintosh to a selected device.

Set/Change/Enter Password commands: Lets you assign, change, or enter passwords for extended management devices.

Preferences dialog box: Contains an option to search for and communicate with extended management devices over AppleTalk.
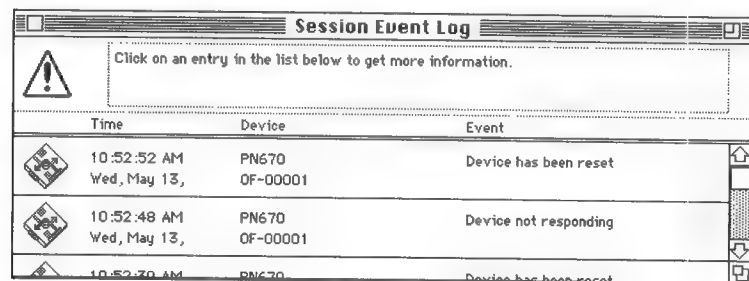
Device Info window: Displays the hub or router node name, type, zone, and address for the device.

Update Port Names command: Recopies the node names of AppleTalk devices served by repeater ports into the Port Name fields. An AppleTalk device node name may be the User Name, Owner Name, or other AppleTalk name assigned to the device. If multiple devices are attached to a port, StarCommand copies only one device node name into each Port Name field.

Recording network events in the Session Event Log

The Session Event Log records network events that have occurred while running StarCommand. For example, an entry is posted for a jammed port or disconnected device.

Each entry may include an event description, date, time, serial number, port number, test results, or other details. The Session Event Log provides the network manager with a useful written history of network events.

Here are more details about the Session Event Log:

■   Entries are shown in chronological order, with the events that occurred most recently listed at the top of the Session Event Log.

■   The Session Event Log can be printed using the Print Window command.

■   The Session Event Log can be saved to a tab-delimited text file using the Export Session Event Log command.

■   Entries are added even while StarCommand is running in the background under MultiFinder or System 7.

■   Once posted, entries remain in the Session Event Log until you close the StarCommand file. You can clear all the entries without closing the file by using the Clear Session Event Log command.

- You can have StarCommand automatically bring the Session Event Log to the front whenever a network event occurs by changing the Alert By option in the Preferences dialog box.

- Unlike the Router Event History, the Session Event Log records events that pertain to all devices shown in the Device List, rather than just the currently selected device.

Related commands: Show Session Event Log, Export Session Event Log, Clear Session Event Log, Print Window.

About statistics

StarCommand displays many different detailed statistics for devices. These statistics tell you more about the activity on your network. A complete description of each statistic can been seen in Appendix A.

Here are some general guidelines regarding statistics:

- Devices have built-in counters that record statistics 24 hours a day, whether or not StarCommand is running.

- StarCommand can read the statistics and display them. You can display aggregate traffic and error statistics in the Device List and Port List using the pop-up menus. The Port Info window displays detailed statistics for an individual repeater port. The Device Info window displays detailed statistics for the device as a whole. The Routing Table window displays statistics that are specifically related to AppleTalk routing.

■ The Clear Statistics command resets repeater and general device counters to zero. To clear statistics that are specifically related to AppleTalk routing, use the Clear button in the Routing Table window.

■ Any user can display statistics for all devices shown in the Device List, including password-protected devices with a read-only status.

■ The port interconnect setting controls whether or not repeater port statistics are included in the repeater statistics totals for the 307, 357, and 377 hubs and the StarRouter. Repeater totals include statistics for repeater ports with port interconnect switched off, but repeater totals ignore statistics for repeater ports with port interconnect switched on.

■ Since the device counters run constantly, they frequently reach their maximum value and "roll over" to zero. The counters roll over individually, and often a traffic counter rolls over before an error counter. In this case, the error-to-traffic ratio appears falsely high. To get an accurate reading of the statistics, reset the counters, then take a reading before any of the counters roll over.

Related commands: Clear Statistics, Device Info, Port Info, Show Routing Table.

```
File
New              ⌘N
Open...           ⌘O
Close            ⌘W
Save             ⌘S
Save As...
..................................
Set File Password...
..................................
Set Preferences...
..................................
Show Session Event Log
Clear Session Event Log
Export Session Event Log...
..................................
Page Setup...
Print Window...      ⌘P
..................................
Quit              ⌘Q
```

File menu

The File menu contains commands that pertain to the StarCommand file, search and alert preferences, the Session Event Log, and printing.

New

Opens a new, untitled StarCommand document and displays a blank Device List. If a StarCommand file is currently displayed, this command is dimmed. StarCommand begins searching for devices as soon as you select this option.

Open

Displays a directory dialog box to retrieve a StarCommand file from disk and display it. If the file you have selected is password protected, you will be asked to enter the password. Once you have opened the file, StarCommand attempts to reestablish communication with all the devices named in the file. Entries are made in the Session Event Log if StarCommand cannot locate a device or if changes have been made to device settings since you last saved the file.

The StarCommand file stores the current search setting. For more information about opening a file, see "Displaying Data in the Device List" in Chapter 3.

▶ **Note:** Only one StarCommand file can be open at a time. Close any open StarCommand file before attempting to open another. This applies to Untitled files, as well as files that have been saved.

Close

Closes the active window. If you close the Device List and the current StarCommand file has unsaved changes, a message appears reminding you to save changes. Click Save to save changes; if the StarCommand file is untitled, the Save As dialog box appears so you can name the StarCommand file. Click Don't Save to close without saving changes.

Save

Saves the current StarCommand file to disk. If the StarCommand file is untitled, the Save As dialog box appears so you can name the StarCommand file. For more details, see "Information Saved in a StarCommand File" in Chapter 3.

Save As

Displays the Save As dialog box, which lets you name the current StarCommand file and select a destination folder.

You can create multiple copies of the current StarCommand file by typing in a new name after you select the Save As command. This is an easy method for creating a backup of the StarCommand file, or for experimenting with slight variations to the file.

Set Preferences

This command controls settings that affect where StarCommand searches for devices and how StarCommand alerts you. These settings are saved when you save any StarCommand file. If you want these settings to be the defaults for new StarCommand files, use the Save Defaults button to save these settings to a preferences file in your System Folder. For more details about searching, see "Searching for Devices" in Chapter 3.
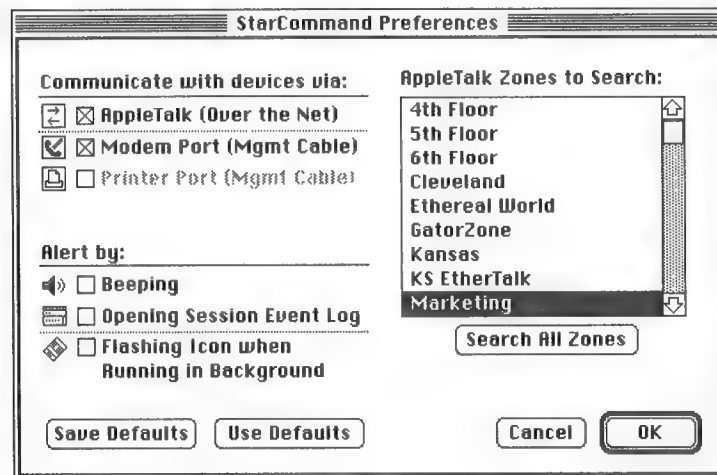
Communicate with Devices Via

Controls the connections StarCommand uses to communicate with devices. You can select an AppleTalk connection and/or serial port. StarCommand can control devices through multiple connections simultaneously. If StarCommand detects two or more paths to the same device, it uses the management bus to reach write-protected devices, and uses the fastest path it can detect for all other devices. To maintain the fastest response time, deselect any unused connections.

■ **AppleTalk (Over the Net):** Select this option if your Macintosh is connected to an AppleTalk network and you would like to control devices over the network. StarCommand locates devices that support extended management and any additional devices attached to the extended management devices via the management bus. This option appears dimmed if AppleTalk is inactive in the Chooser.

■ **Modem Port (Mgmt Cable):** Select this option if you have a management cable directly attached to the modem port. This option appears dimmed if the port is being used by AppleTalk or another application or device.

■ **Printer Port (Mgmt Cable):** Select this option if you have a management cable directly attached to the printer port. This option appears dimmed if another application or AppleTalk is using the port.

AppleTalk Zones to Search

Lets you specify the zones where StarCommand searches for devices that support extended management.

Select a zone by clicking. Shift-click to select multiple zones. Click Search All Zones to have StarCommand search all available zones. To maintain the fastest response time, select only those zones that have extended management devices. It serves no purpose to search a zone that contains an older hub but no extended management device, as an older hub cannot recognize StarCommand signals it receives via AppleTalk. An AppleTalk search can find an older hub only by first finding an extended management device that is connected to the same management bus, even if it is not in the same zone as the older hub. The extended management device transforms AppleTalk StarCommand signals into management bus signals that the older hub can recognize, and transforms the older hub's management bus responses back into AppleTalk signals that StarCommand receives.

Alert by

StarCommand can inform you whenever a network event occurs, such as when a repeater port jams or a device no longer responds. You can choose from three different types of alerts depending upon your particular preference:

■   **Beeping.** The Macintosh beeps once when a network event occurs.

■   **Opening Session Event Log.** The Session Event Log opens and becomes the active window when a network event occurs.

■   **Flashing Icon When Running In Background.** A flashing icon appears over the Apple icon in the menu bar when a network event occurs. This option only applies when StarCommand is running in the background under MultiFinder or System 7.

Save Defaults

Saves the current preferences settings to a configuration file called "StarCommand Preferences." StarCommand creates this file and places it in a folder called "Preferences" inside the System Folder.

Use Defaults

Changes the current settings to match the setting stored in the StarCommand Preferences file. If the StarCommand Preferences file has been deleted or moved, StarCommand will use the original default settings.
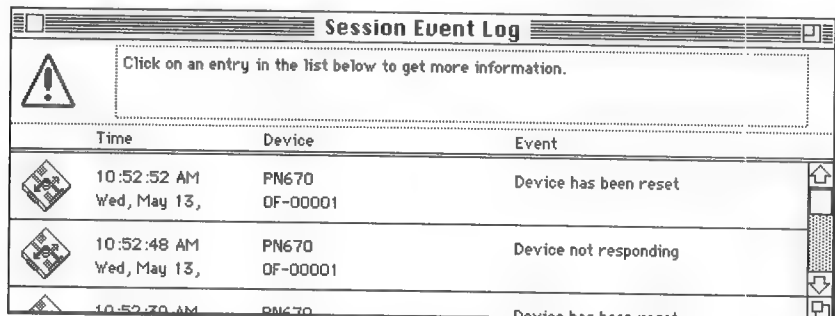
Cancel

Closes the window without saving the changes to the preferences.

OK

Closes the window and applies changes to the current StarCommand file.

Show Session Event Log

Displays a list of entries detailing network events that have occurred since you opened the current Device List. The Session Event Log provides the network manager with a useful written history of network events, including events that pertain to many devices. Each entry includes an event description, date, time, and device serial number, and may include a port number, test results, or other details.

For more information about the Session Event Log, see "Recording Network Events in the Session Event Log" in Chapter 3.

Clear Session Event Log

Clears all of the entries on the Session Event Log. You cannot clear individual entries.

Export Session Event Log

Displays a directory dialog box to save the entries in the Session Event Log to a tab-delimited text file. You can later open the text file with a spreadsheet or word processing application.

Page Setup

Displays a dialog box with the standard choices for paper size and printing enhancements. The printing effects available depend on which printer is selected in the Chooser. The standard Page Setup dialog boxes are described in the documentation that came with your Macintosh.

Print Window

Prints the active window. You can print the Device List, Port List, Session Event Log, and Omitted Devices.

When you choose Print, StarCommand displays the Print dialog box that corresponds to the printer you selected in the Chooser. The standard Print dialog boxes are described in the documentation that came with your Macintosh.

Quit

The Quit command ends a StarCommand session and returns you to the Finder or previous application under MultiFinder or System 7. If the current StarCommand file has not been saved, StarCommand asks if you want to save the changes before closing. Clicking Save saves the changes. If the StarCommand file is untitled, the Save As dialog box appears so you can name the StarCommand file. Clicking Don't Save discards the changes.

Edit	
Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘U
Clear	
Select All	⌘A

Edit menu

The Cut, Copy, Paste, and Clear commands are available only when you are editing device names, port names, comments, or text fields in some dialog boxes. The Undo command is not available within StarCommand; you cannot undo device control actions such as changing settings or resetting a device.

Select All

Selects all the devices or ports in the active window. This command applies to the Device List, Port List, and Omitted Devices window. You can deselect a device or port by holding down the Shift key and clicking it. You can deselect all devices or ports by clicking in the window header.

Control	
Open Port List	⌘E
Device Info	⌘I
Turn All Ports On	
Turn All Ports Off	
Test All Ports	⌘T
Set Password...	
Reprogram Device...	
Update Port Names	⌘U
Clear Statistics	
Reset Device	⌘R
Reset All Devices	
Show Omitted Devices	
Omit Device	
Reinstate Device	
Quick Find...	⌘F
Searching On	⌘L

Control menu

This menu contains options to manage the features of Farallon repeating hubs and some features of Farallon hardware routers.

Open Port List

The Open Port List command is only available when one or more repeating devices have been selected in the Device List, such as StarController hubs or StarRouters. The command displays a repeater Port List for the selected devices.

The Port List displays repeater port information and lets you change settings for repeater ports. A complete description of the Port List appears in Chapter 2, "StarCommand Windows."

Hal's Hub

Hal's Hub
PN357 StarController
09-00004
Firmware Version 1.0

Status : OK

Repeater Traffic %

Last 2 minutes   Last 10 seconds

	Port Name	Traffic (Bytes) ▼		Enables ▼	Traffic	Errors
1	Port 1	0	0.0%	⊠		○
2	192.100.87.140	3,364,428	0.0%	⊠		○
3	Customer Server	18,501,808	1.4%	⊠		○
4	Alison Wellsfry	6,416,356	0.0%	⊠		○
5	Simon's PC	3,610,184	0.0%	⊠		○
6	LiaisonGW Server	4,775,164	0.0%	⊠		○
7	<unnamed>	2,073,588	0.0%	⊠		○
⚠	Port 8	384,238	0.0%	⊠		○
9	dial-in 1	6,529,924	0.0%	⊠		○
10	Katies PC	3,847,444	0.6%	⊠		○
11	192.100.87.135	88,204,164	1.2%	⊠		○
12	TechSports	50,221,652	4.8%	⊠		○

Device/Port Info

The Device Info window displays statistics, device information, and comments for Farallon hubs and routers. The Port Info window displays statistics, port information, and comments for a selected individual repeater port.

<table>
<tr>
<td>

Device Info

Hal's Hub
PN357 StarController
09-00004
Firmware Version 1.0

Status: OK

Statistics:

LT Repeater Traffic (Bytes):	16,080
LT Repeater Traffic (Packets):	5,356
LT Total Errors:	0
LT Mgmt Traffic (Bytes):	8,040
LT Mgmt Traffic (Packets):	2,678

Network Information:

Name:	Hal's Hub
Type:	StarController 357
Zone:	5th Floor
Address:	4.25.254

Comments:

Located in the 4th floor wiring closet

</td>
<td>

Port Info

Simon's PC
Port 5
Hal's Hub
09-00004

Status: OK

Statistics:

Traffic (Bytes):	3,620,072
Fragments:	344
Jams:	0
Traffic (Packets):	134,986

Name:	Net.Node:
Museumroom	4.103
Simon's PC	4.12

Comments:

Wires are located in the ceiling.

</td>
</tr>
</table>

Device Info is available when you select one or more devices in the Device List, or whenever the Port List is the active window and no ports are selected. The Device Info window displays total traffic and error figures for the device; the fields shown vary depending upon the model of device selected.

Port Info is available when you select one or more repeater ports in the Port List. The Port Info window displays traffic and error figures for the repeater port; the fields shown vary depending upon the model of device selected.

A complete description of the Device Info and Port Info windows appears in Chapter 2, "StarCommand Windows." For details on the statistics, see Appendix A or "About Statistics" in Chapter 3.

Turn All On/Off

Switches on and off particular settings for all of the repeater ports on the selected StarController hub or StarRouter. This command is not available for devices that are set for read-only access through password protection, or for devices that do not include repeaters.

The "Turn All On/Off" commands are available when one or more devices are selected in the Device List, or when the Port List is displayed. The current selection in the pop-up menu in the active window determines what command appears in the Control menu. For example, if you have selected Interconnects in the pop-up menu, the command "Turn All Interconnects On/Off" appears in the Control menu.

Turn All Ports On/Off applies to all StarController hubs and StarRouters. It enables or disables all the repeater ports on the selected device or devices.

Turn All Interconnects On/Off applies to StarController 307, 357, and 377 hubs, and to StarRouters. This setting controls a repeater port's tolerance to fragments and jams.

Turn All Link Integrities On/Off applies to 507 hubs only. This setting controls a port's link integrity test.

Test Port/Test All Ports

Tests the line quality of LocalTalk repeater ports. Use this command to determine if network branch wiring is properly terminated. The test results are saved in the Session Event Log and can be displayed in the Port List. Test result values range between 1 and 100, from poorest to best. Keep in mind that test results are approximate.

Test All Ports is available when you select one or more LocalTalk hubs or routing hubs in the Device List, or when no ports are selected in the Port List.

Test Port(s) is available when you select one or more ports in the Port List. Test results are automatically displayed in the Port List.

▶ **Note:** If a port has no wiring attached, test results for that port cannot be predicted.

Set/Enter/Change Password

Allows you to set, enter, or change a password for an extended management device.

Set Password assigns a password to an extended management device. Once a device is password protected, controls and settings for it have a read-only status. A user can gain read/write access to controls and settings in two ways: either by using StarCommand over a management cable, rather than AppleTalk, or by entering the correct password for the device or its management gateway. (For more information on device passwords and management gateways, see "Device Password Planning" in Chapter 3.) Device controls include resetting a device, changing the node name, resetting the statistics, line testing, and reprogramming. Device settings include the repeater port interconnect, repeater port enable, link integrity, and all routing and gateway parameters.

Enter Password allows you to gain access to the controls and settings of a password-protected device while using StarCommand over AppleTalk. (If you are using a management cable, rather than AppleTalk, you have automatic read/write access and do not need to enter passwords.) For a device that StarCommand has found via AppleTalk, you must use the device's own password. For a device StarCommand has found via the management bus, you must use the password of that device's management gateway. (For more information on device passwords and management gateways, see "Device Password Planning" in Chapter 3.) When you enter the correct password for a management gateway, you also gain access to the controls and settings of the devices that are using the services of the management gateway. These devices may include both extended management devices and older hubs.

Change Password changes the password for an extended management device. Any user can change the password for an extended management device if he or she knows the original password.

For more information about passwords, see "Password Protecting Extended Management Devices" in Chapter 3.

To password protect an extended management device:

1. Select an extended management device.

2. Choose Set Password from the Control menu.

```
┌─────────────────────────────────────┐
│ ═══════════ Set Password ═══════════ │
│ ┌─────────────────────────────────┐ │
│ │        Marketing hub            │ │
│ │   ▨    PN357 StarController      │ │
│ │        09-13021                 │ │
│ │        Firmware Version 1.0     │ │
│ │                                 │ │
│ │  Enter the password:   [_____] │ │
│ │  Re-enter the password: [_____]│ │
│ │                                 │ │
│ │        [ Cancel ]  [  OK  ]     │ │
│ └─────────────────────────────────┘ │
└─────────────────────────────────────┘
```

3. Type in the password and press Tab. The password can be up to eight characters long. Be sure to notice whether you are typing uppercase or lowercase characters, since StarCommand passwords are case-sensitive.

4. Reenter the password to verify it and click OK or press Return.

   In the Device List, a pencil icon appears alongside the device, indicating that it is password protected.

To gain access to controls and settings for a password-protected device:

1. Select a device that is password protected with read-only access. Device entries that fit this description have an icon resembling a pencil with a slash alongside them.

2. Choose Enter Password from the Control menu, or double-click on the icon resembling a pencil with a slash.

```
┌─────────────────────────────────────────────┐
│ ≡≡≡≡≡≡≡≡≡  Enter Password  ≡≡≡≡≡≡≡≡≡         │
│                                              │
│    ◆    Marketing Hub                        │
│         PN377 StarController                 │
│         09-00082                             │
│         Firmware Version 1.0                 │
│                                              │
│    Enter the password:  ┌──────────────┐     │
│                         └──────────────┘     │
│                                              │
│               ( Cancel )  ╔═══════════╗      │
│                           ║    OK     ║      │
│                           ╚═══════════╝      │
└─────────────────────────────────────────────┘
```

3. Type in the password. Once you have entered the correct password, the device has a read/write status, meaning that you now have access to change the device controls and settings from the currently open StarCommand file.

***To change the password
for an extended
management device:***

1. Select an extended management device that has a read/write status. Devices that fit this description have an icon resembling a pencil alongside them. If the device has an icon resembling a pencil with a slash alongside it, first unlock it following the steps on the previous page, then continue to the next step.

2. Select Change Password from the Control menu.

   ```
   ═══════════════ Change Password ═══════════════

      ◆     Marketing hub
             PN357 StarController
             09-13021
             Firmware Version 1.0


      Enter the existing password:      [_____]

      Enter the new password:           [_____]

      Re-enter the new password:        [_____]

                              ( Cancel )   (( OK ))
   ```

3. Enter the existing password and press Tab. StarCommand is case-sensitive, so be sure you do not use uppercase characters unintentionally.

4. Enter the new password, press Tab, and reenter the new password to verify it.

   ▶ **Note:** If you would like to remove the password, leave the second and third fields blank.

5. Press Return or click OK to change the password.

Reprogram Device

Updates the firmware on an extended management device without replacing any hardware components of the device. This allows you to easily update a device should Farallon add functions to it in the future. Reprogramming does not affect port enables, device names, or any other configuration parameters of the device. You can only reprogram a device using a firmware program file from Farallon. The Reprogram Device command transfers this file from your Macintosh to the hub or router you are updating. For Farallon hardware routers, you have the alternative of using a BOOTP or TFTP server for the firmware transfer. (See the "Router Startup" section of this chapter for more information.)

The Reprogram Device command is only available when you select an extended management device that is unprotected or has read/write access. You can only reprogram one device at a time.

To reprogram an
extended management
device:

1. Obtain a new firmware program file from Farallon.

2. Select an extended management device in the Device List, or open the Port List for an extended management device.

3. Choose Reprogram Device from the Control menu. A directory dialog box will be displayed.

4. Locate the firmware program file and click Open. A dialog box may ask you to enter a special sequence of authorization characters called a key. If so, enter the key provided by Farallon. Once reprogramming begins, StarCommand displays a download progress window.
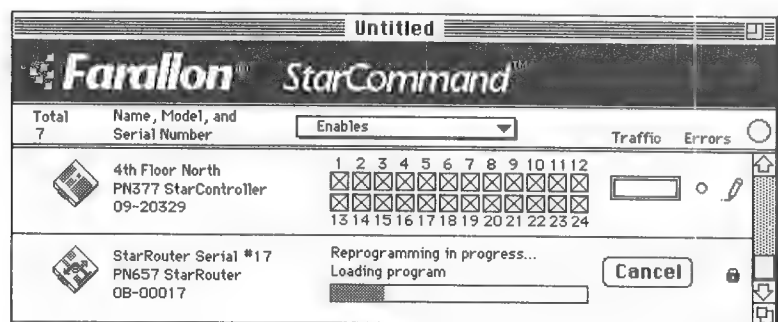
5. Watch the progress window to verify the success of the reprogramming. Note that during downloading the LEDs on a 357 or 377 hub or Interface Module blink in a special sequence.

    When the 357 and 377 hubs are being reprogrammed, the Status LED flashes red throughout the process, and one Traffic LED glows green for each 4K of firmware that is successfully transferred. Once the transfer is complete, the hub does a CRC check on the transferred firmware, and one traffic LED glows green for each 4K of code that has been checked. The sequence completes with the Mgmt Traffic, Quality, and Master Config LEDs glowing red while one traffic LED glows green for each 4K of code that is transferred to Flash-EPROM. The hub then reboots normally to use the new firmware.

    When the Interface Module is being reprogrammed, the Status LED flashes alternately green and red throughout the process.

    ▶ **Note:** At the completion of reprogramming a Concentrator Interface Module, the Interface Module is automatically reset. This also resets the other devices in the Concentrator.

    Downloading firmware takes several minutes. During this time the device is unavailable for regular network use.

Update Port Names

Recopies individual AppleTalk device node names into the Port Name fields of the Port List. A device node name may be the User Name, Owner Name, or other AppleTalk name assigned to the device. If multiple devices are attached to a port, StarCommand copies only the device node name that would come last in an alphabetical list of node names for that port. Note that it may take a few minutes for the names to update.

This command is available only when the Port List for an extended management device is open.

Clear Statistics

Resets the statistics counters displayed in the Device List, Port List, Device Info, and Port Info windows for the selected device. (You can clear router statistics by using the Clear button in the Routing Table window.) The Clear Statistics command is available when the Device List, Port List, Device Info window, or Port Info window is open. This command is not available for password-protected devices that have a read-only status.

For more information about the counters, see Appendix A and "About Statistics" in Chapter 3.

Reset Device

Resets the selected devices. A confirmation dialog appears when you select this command. This command has the same effect as turning a device off and on. This process generally lasts 5 to 10 seconds. See the user's guide for your Farallon hub or router for more details about the reset function.

The Reset Device command is available when you select one or more devices in the Device List, or when the Port List is open. You cannot use this command to reset a password-protected device that is set for read-only access.

Reset All Devices

Resets all devices for which you have read/write access. This can include devices displayed in the Device List, devices that have been omitted, and devices not yet located by StarCommand.

This command has the same effect as turning all the devices off and on. This process lasts several seconds. See the user's guide for your Farallon hub or router for more details about the reset function.

This command is available whenever a StarCommand file is open. A confirmation dialog appears when you select this command. We recommend that you use this command with caution as it may disrupt network traffic for 15 seconds or more.

Show Omitted Devices

Shows the Omitted Devices window. Devices appear in this window if they have been omitted from the current StarCommand file and remain in this window until you close the current StarCommand file or reinstate them.
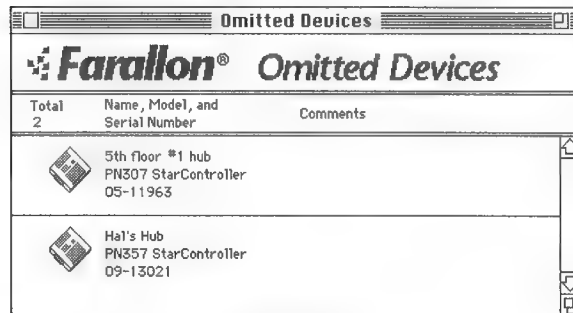
Omit Device

Removes the selected device from the current StarCommand Device List. For example, you may want to use this command to update the current StarCommand file after a device has been physically removed from the network. Otherwise, StarCommand would continue searching for the missing device.

This command is available when you select one or more devices in the Device List. You can remove any device, including a password-protected device with a read-only status. Omitted devices appear in the Omitted Devices window until you close the StarCommand file.

Each time you open a StarCommand file, the Omitted Devices window starts out empty. It remains empty until you omit at least one device. If you open a pre-existing StarCommand file which you saved after omitting a device, the previously omitted device will not appear in the Device List unless Searching On is selected and StarCommand rediscovers the device.

▶ **Note:** Omitting a device does not affect its network functionality. An omitted device continues to function normally but does not appear in the current StarCommand Device List.
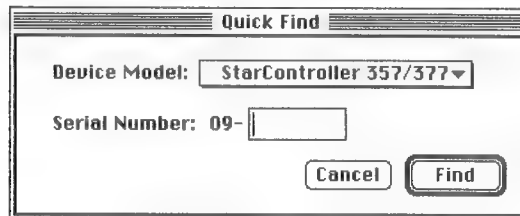
Reinstate Device

Moves a device from the Omitted Devices window back to the Device List. To reinstate a device, choose Show Omitted Devices from the Control menu, select the device you wish to reinstate, and then use the Reinstate Device command. Once reinstated, StarCommand will try to reestablish communication with the device.

Quick Find

Locates and selects one device within the Device List when you specify its device model and serial number. This command is particularly useful for finding a single device quickly when your internet contains many devices.

▶ **Note:** StarController 207 hubs do not have unique individual serial numbers. In place of a serial number, a 207 hub uses the decimal equivalent of its hexadecimal management address, which is set via hardware DIP switches.

```
═════════════ Quick Find ═════════════

   Device Model:  [ StarController 357/377 ▼ ]

   Serial Number:  09-[          ]

                        ( Cancel )  (( Find ))
```

Searching On

Directs StarCommand to search for new devices or stop searching for new devices. This command is available whenever a StarCommand file is open.

With Searching On selected, StarCommand continues searching for new devices and adding them to the Device List. The search indicator at the top right corner of the Device List rotates to confirm that searching is in progress.

With Searching On deselected, StarCommand continues to maintain communication with the devices in the Device List, but does not search for new devices.

As a shortcut, you can select or deselect Searching On by double-clicking the search indicator. By default, Searching On is selected when you create a new, untitled Device List.

▶ **Note:** If you use MultiFinder to run background tasks while using StarCommand, you may find that selecting Searching On slows the progress of your background tasks. To maintain best overall performance, deselect Searching On whenever you do not need to search for more devices.

View
✓Expanded View
  Condensed View
....
  Sort by Name
  Sort by Model
  Sort by Serial Number
  Sort by Status
✓Unsorted
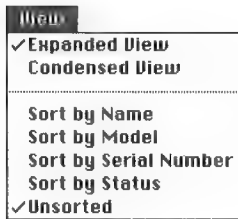
View menu

The commands in the view menu allow you to vary how StarCommand displays information in the Device List, Session Event Log, and Omitted Devices windows.

Expanded View

Displays the Device List, Session Event Log, or Omitted Device window in an expanded view, with more information and details about each entry than shown in the condensed view. The expanded view is useful when you want to see detailed information about multiple entries at a glance. This is the default view for an untitled Device List.
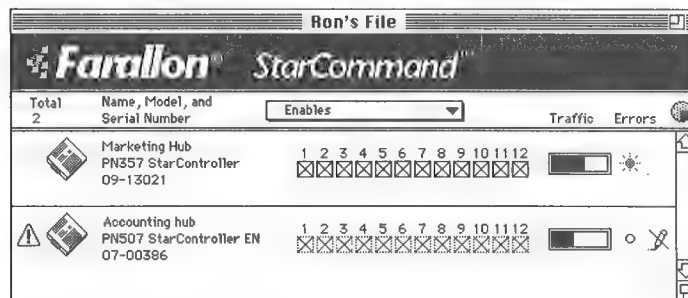
Device List (expanded view)

Condensed View

Displays the Device List, Session Event Log, or Omitted Device window in a condensed view, with less information and details about each entry than are shown in the expanded view. The condensed view is useful when you need to view many entries at a glance.

Device List (condensed view)

Sort commands

You can sort the devices displayed in the Device List. Sorting helps you organize the Device List. Whenever the Device List is the active window, you can sort by name, model, serial number, or status.

When you select one of the sort options, StarCommand sorts the devices from A to Z. StarCommand is not case sensitive; uppercase and lowercase letters are sorted as equals.

Devices that are physically located in a Farallon Concentrator are sorted as a block, indicated by a black border in the Device List. The Interface Module always appears first in such a block. Each Concentrator block's place in the overall sort order is based on the information applying to its Concentrator Interface Module. Following the Interface module, the other devices in each Concentrator block are sorted within the block according to the type of sort you choose.
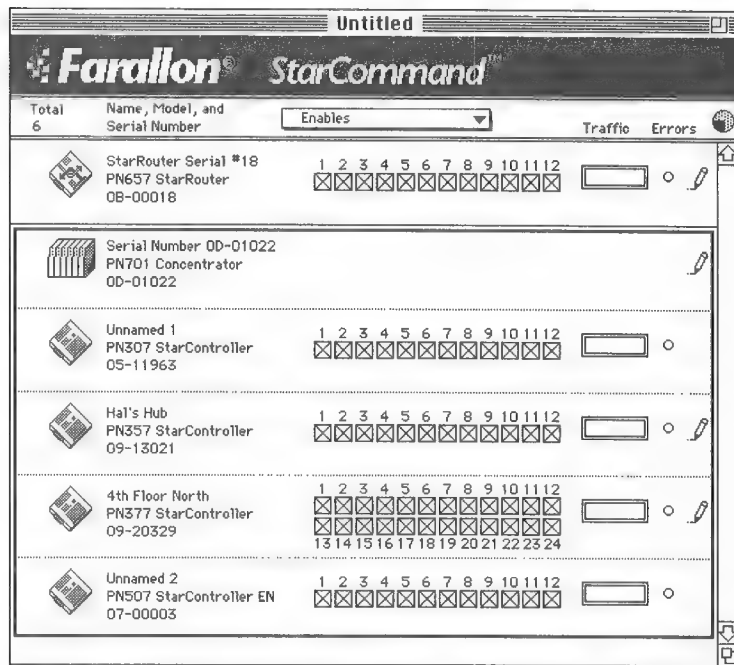
Device List containing a Farallon Concentrator and sorted by Model

As long as Searching On is selected, the Device List is re-sorted when StarCommand locates a new device, unless you have selected Unsorted.

Sort by Name

Sorts the devices by the user-defined device name.

Sort by Model

Sorts the devices by the model number.

Sort by Serial Number

Sorts the devices by serial number. The first two digits of the serial number distinguish the device model, the last five identify the individual device.

Model Number	Device Name	Category Number
207	StarController ("Black Beauty")	01
307	StarController	05
357	StarController/12	09
355	StarController/24	09
407	StarController EN	03
507	StarController EN	07
657	StarRouter	0B
670	InterRoute/5	0F
701	Concentrator Interface Module	0D

Sort by Status

Sorts devices according to their status. Devices with any type of alert status appear on the top of the list.

Unsorted

Leaves the list unsorted. This is the default sort option. New devices are appended to the bottom of the Device List. Select Unsorted if frequent re-sorting of the Device List disrupts your work.

```
Router
  AppleTalk Setup...
  Router Startup...
  Set Clock...

  IP Setup...
  MacIP Setup...
  IPTalk Setup...
  IP Tunnelling Setup...
  SNMP Setup...

  Show Routing Table

  Show Router Event History
  Clear Router Event History
  Export Router Event History...
```

Router Menu

If your internet contains Farallon hardware routers and gateways such as the StarRouter or the InterRoute/5 router, StarCommand displays a sixth menu, the Router menu. The commands in this menu apply only to routers and gateways, so the menu is not displayed if your network contains no Farallon routers or gateways. See the *StarRouter User's Guide* or the *InterRoute/5 User's Guide* for more information on configuring routers and gateways.

▶ **Note:** Router and gateway configuration changes do not take effect until you have reset the device.

AppleTalk Setup

This command controls the AppleTalk router port settings for the selected Farallon hardware router.

```
═══════════════════ AppleTalk Setup ═══════════════════

    ╔═╗   PN670
    ║  ║   PN670 InterRoute/5
    ╚═╝   0F-00001
          Firmware Version 1.0
..........................................................................
  Port            Enable   Hide    Net      Range    Zone Name

  LocalTalk 1       ☒       ☐    [1001]              [G&A            ]

  LocalTalk 2       ☒       ☐    [3000]              [Sales          ]

  LocalTalk 3       ☒       ☐    [1003]              [Customer Service]

  LocalTalk 4       ☒       ☐    [1004]              [Design         ]

  EtherTalk Phase 1 ☐       ☐    [10  ]              [EtherTalk Phase 1]

  EtherTalk Phase 2 ☒       ☐    [20  ]    [20  ]    [Mfg            ]

                                          [ Cancel ]  [  Set  ]
```
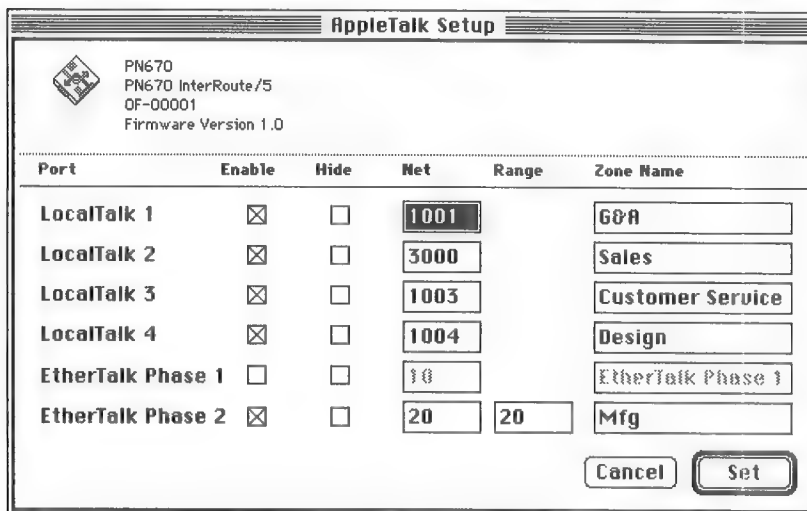
AppleTalk Setup dialog for an InterRoute/5 router

```
┌─────────────────────────────────────────────────────────┐
│ ══════════════════════ AppleTalk Setup ════════════════  │
│                                                           │
│  ◆   PN657                                                │
│      PN657 StarRouter                                     │
│      0B-00017                                             │
│      Firmware Version 1.0                                 │
│                                                           │
│  Port            Enable Hide  Net      Range   Zone Name  │
│  ──────────────────────────────────────────────────────  │
│  LocalTalk         ☒     □   ┌─────┐          ┌─────────┐ │
│                              │4195 │          │Documentation│
│                              └─────┘          └─────────┘ │
│  EtherTalk Phase 1 □     □   ┌─────┐          ┌─────────┐ │
│                              │ 0   │          │Un-Named │ │
│                              └─────┘          └─────────┘ │
│  EtherTalk Phase 2 ☒     □   ┌─────┐ ┌─────┐  ┌─────────┐ │
│                              │20   │ │ 20  │  │Mfg      │ │
│                              └─────┘ └─────┘  └─────────┘ │
│                                                           │
│                                    ┌────────┐ ┌────────┐  │
│                                    │ Cancel │ │  Set   │  │
│                                    └────────┘ └────────┘  │
└─────────────────────────────────────────────────────────┘
```

AppleTalk Setup dialog for a StarRouter

Enable

This setting controls which router ports are active on the selected device. Click the appropriate checkboxes in the Enable column to select routing to and from any combination of LocalTalk, EtherTalk Phase 1, and EtherTalk Phase 2 networks. Router ports must be enabled if they are to send and receive AppleTalk packets, even if such packets are part of communication sessions with IP computers. For example, MacIP communication between LocalTalk nodes and IP hosts requires that the LocalTalk router port be enabled, though the EtherTalk ports may be disabled.

To enter configuration information for a router port, you must first enable it.

▶ **Note:** In contrast to repeater port enables, which take effect immediately, router port enables do not take effect until the router is reset. All router or gateway configuration changes require a reset to take effect.

Hide

This setting controls whether or not the indicated router port will prevent certain types of information from being transmitted from the network it serves to other parts of the internet. A hidden port acts like a sort of one-way mirror. Nodes on a network with a hidden port may gather information and start communication sessions with nodes on other parts of the internet, but not vice versa. (Nodes outside the hidden parts of the network can detect zone names for hidden networks, but cannot detect individual nodes on those networks.) Click the appropriate checkbox to hide a router port on the selected device.

Remember that a network containing more than one AppleTalk router cannot be effectively hidden unless all router ports serving that network are hidden. To hide a LocalTalk network with only one router, you would only need to hide the LocalTalk port of the one router. To hide an EtherTalk Phase 2 network with several routers, you would need to hide the EtherTalk Phase 2 ports of all the routers connected to that network. Note, however, that you would *not* need to hide EtherTalk Phase 1 ports of those same routers, since EtherTalk Phase 1 and EtherTalk Phase 2 are considered to be different logical networks, even when they share the same cabling.

Net and Range

These settings give you the option of assigning specific AppleTalk network numbers to the networks served by the selected device. A LocalTalk or EtherTalk Phase 1 network can only have one network number—type each of their numbers in appropriate boxes in the Net column. To use a continuous range of network numbers for an EtherTalk Phase 2 network, type the first network number of the range in the EtherTalk Phase 2 box in the Net column, and the final network number in the box in the Range column.

If no other routers are connected to a network, and if you do not choose network number values, your Farallon hardware router will normally choose a unique single network number for each enabled router port.

Whenever it is reset, a Farallon hardware router seaches for other routers on each network it serves. If other routers are already operating on these networks, they provide network number and zone name information to the Farallon hardware router. If the network number information provided by another router does not match the information configured via StarCommand, a Farallon hardware router will use the network number information provided by the other router. This is called **soft seeding**. Farallon routers provide soft seeding or **no seeding** (explained in the following section). They do not provide **hard seeding**. In hard seeding, a router either uses the network numbers specified in its configuration, or disables any of its own ports whose configurations conflict with the information provided by other routers.

Zone Name

This setting allows you to assign zone names to the networks served by the selected device. The default zone name used by all Farallon routers is Un-Named.

- **LocalTalk and EtherTalk Phase 1:** You may only use one zone name for each LocalTalk network or EtherTalk Phase 1 network. Type the names you choose into the appropriate boxes in the Zone Name column.

- **EtherTalk Phase 2:** You may use multiple zone names for an EtherTalk Phase 2 network.

  ▶ **Note:** If there are EtherTalk Phase 1 networks on your internet, using multiple zones for an EtherTalk Phase 2 network may disrupt traffic, and is not recommended.

To specify one or more zone names for an EtherTalk Phase 2
network, click in the EtherTalk Phase 2 Zone Name box, and a
new dialog box will appear:

```
┌─────────────────────────────────────────┐
│ ════════ EtherTalk Phase 2 Zones ════════ │
│  ┌─────────────────────┐ ┌─────────┐     │
│  │ Mfg              ⬆ │ │ Default │     │
│  │                     │ └─────────┘     │
│  │                     │ ┌─────────┐     │
│  │                     │ │   Add   │     │
│  │                     │ └─────────┘     │
│  │                     │ ┌─────────┐     │
│  │                     │ │ Change  │     │
│  │                  ⬇ │ └─────────┘     │
│  └─────────────────────┘ ┌─────────┐     │
│                          │ Delete  │     │
│  ┌─────────────────────┐ └─────────┘     │
│  │ QA                  │                  │
│  └─────────────────────┘                  │
│            ┌────────┐  ┌──────┐           │
│            │ Cancel │  │ Set  │           │
│            └────────┘  └──────┘           │
└─────────────────────────────────────────┘
```
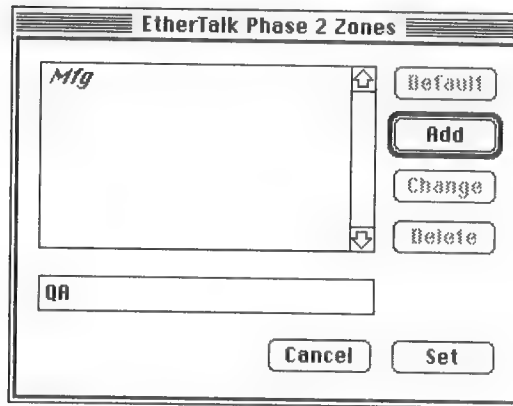
EtherTalk Phase 2 Zones dialog box

To add a zone name, type the new name in the box below the
scrolling list, and click the Add button. (The first zone name
you enter will replace "Un-Named.") To change a zone name,
click to select the name you wish to change, type your
changes in the box below the scrolling list, and click the
Change button. To delete a zone name, click to select the
name you wish to delete, and click the Delete button. To
choose a default zone, click to select the zone name you
prefer, and click the Default button. The name of the current
default zone appears in italic type in this dialog box. It is also
the zone name displayed in the AppleTalk Setup dialog box for
EtherTalk Phase 2.

Farallon routers recognize one special zone name, the asterisk character (*). Entering just an asterisk in the zone name field for any router port sets the router to enable the **no seeding** option for that port. This means that after it is reset, the router attempts to get network number and zone information from an already operational router on that network. If there is no reply, the router does not choose a network number for any router port that is set for no seeding, but monitors network traffic on that port until it detects another router, and then requests the configuration information again. A router port set for no seeding cannot be used for routing until another router has provided the necessary network number and zone information. Once it is operational, a router port set for no seeding can provide network number and zone information to other routers.

When you reset a Farallon hardware router that is using soft seeding (the default), it accepts zone name information about its LocalTalk, EtherTalk Phase 1, and EtherTalk Phase 2 networks from already operational routers, rather than use conflicting settings configured via StarCommand.

Cancel

This button closes the dialog box without saving any changes to the AppleTalk router settings.

Set

This button closes the dialog box and retains changes to the AppleTalk router settings for the selected device. The new settings actually go into effect when the selected device is reset.

Router Startup

A Farallon hardware router may undergo two kinds of resets: a **warm reset**, in which the router uses the firmware already loaded into its memory, or a **cold reset** (sometimes called a restart), in which the router re-loads its firmware into memory from a separate storage location called a **boot source**. The warm reset is the default; a cold reset is used only when there is no usable firmware in memory or when a router receives a request for a cold reset from StarCommand or an SNMP application. Cold resets are normally requested during troubleshooting or when reprogramming a device.

Router firmware consists of programmed instructions for router operation. Like many programs, router firmware requires input data — the router configuration. Your Farallon hardware router is shipped with default configuration information which you can modify. Modifying the router configuration does not necessarily change the firmware, and changing the firmware does not necessarily change the operating configuration of the router.

The Router Startup command allows you to specifically request a cold reset. It controls how the selected Farallon hardware router obtains its firmware during a cold reset. It also controls whether the router preserves existing configuration settings or reverts to factory defaults. The parameters displayed in this dialog depend on the Boot Source you choose from the pop-up menu shown here.
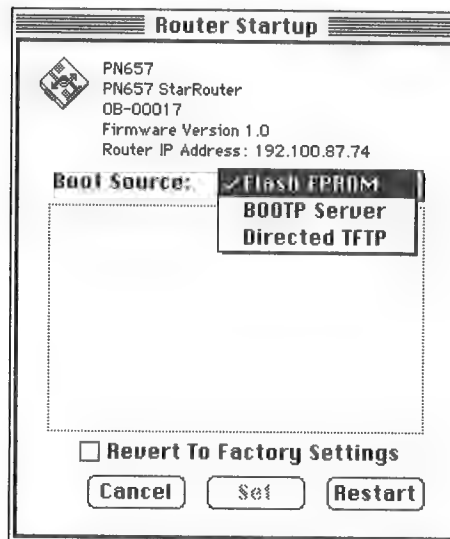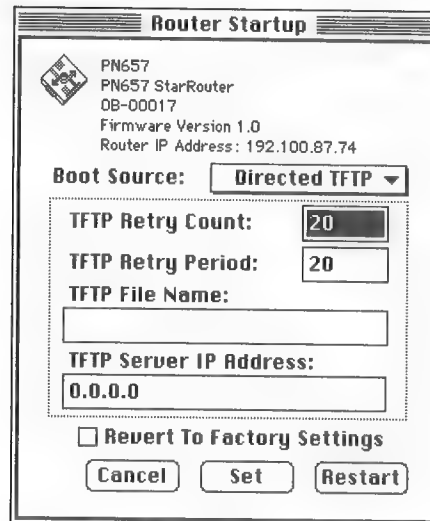
Boot Source

During a cold reset, your Farallon hardware router can obtain its firmware from one of three different boot sources:

- A Flash-EPROM chip stored on the router itself

- An IP computer that contains the firmware file and is set up as a TFTP server

- An IP computer that contains the firmware file and is set up as a BOOTP and TFTP server.

These three options are described in the following paragraphs.

- **Flash-EPROM:** Flash-EPROM is the default boot source for Farallon hardware routers. If you use the IP Setup dialog in StarCommand to make any desired changes to the router's IP address, and if you use the Reprogram Device command in StarCommand to make any necessary firmware upgrades, you may keep your router Boot Source parameter set to Flash-EPROM.

- **Directed TFTP:** Directed TFTP allows you to upgrade Farallon hardware router firmware by transferring a firmware file from the TFTP server to the router during a cold reset. (Alternatively, you can upgrade firmware by using the Reprogram Device command in StarCommand, without using a TFTP server.) If an attempt to use Directed TFTP fails, the router attempts to use the firmware stored in Flash-EPROM. If the attempt to use Directed TFTP succeeds, the router stores the new firmware in Flash-EPROM for future use. Whether the attept to use TFTP succeeds or fails, the Boot Source parameter reverts to Flash-EPROM.
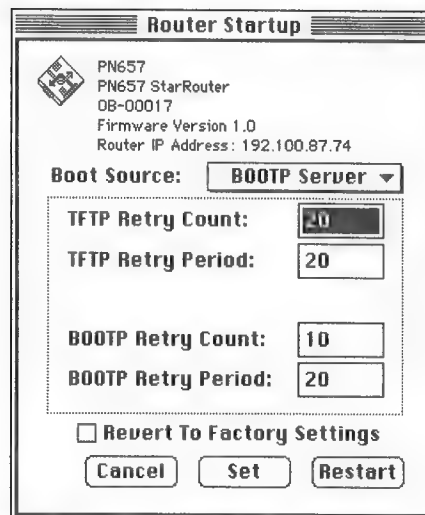
```
┌──────────────────────────────────────┐
│ ═══════════  Router Startup  ═══════  │
│  ◆  PN657                             │
│     PN657 StarRouter                  │
│     OB-00017                          │
│     Firmware Version 1.0              │
│     Router IP Address: 192.100.87.74  │
│  Boot Source:   [  Directed TFTP ▼ ]  │
│  ┌──────────────────────────────┐     │
│  │ TFTP Retry Count:    [ 20 ]   │     │
│  │ TFTP Retry Period:   [ 20 ]   │     │
│  │ TFTP File Name:               │     │
│  │ [                        ]    │     │
│  │ TFTP Server IP Address:       │     │
│  │ [ 0.0.0.0               ]     │     │
│  └──────────────────────────────┘     │
│     □ Revert To Factory Settings      │
│    [ Cancel ]  [ Set ]  [ Restart ]   │
└──────────────────────────────────────┘
```

☐ **TFTP Retry Count:** This parameter governs how many communication attempts the router makes, if it cannot obtain its firmware from the TFTP server on the first request.

☐ **TFTP Retry Period:** This parameter governs how long the router waits between attempts to communicate with the TFTP server, if there are communication difficulties. This parameter is displayed in 50 millisecond units (a value of 1 equals 50 milliseconds, a value of 20 equals 1 second). The maximum value is 32,767.

☐ **TFTP File Name:** This parameter specifies the name of the firmware file stored on the TFTP server.

☐ **TFTP Server IP Address:** This parameter specifies the Internet Protocol (IP) address of the TFTP server.

▶ **Note:** Before using Directed TFTP, you must first use the IP Setup dialog box to enable IP and specify IP parameters for the router.

- **BOOTP Server:** BOOTP allows you to upgrade Farallon hardware router firmware by transferring a firmware file from a BOOTP-and-TFTP server to the router during a cold reset. (Alternatively, you can upgrade firmware by using the Reprogram Device command in StarCommand, without using a BOOTP-and-TFTP server.) Farallon routers use BOOTP to establish communication between the router and the server, and then use TFTP to transfer the actual firmware file. Since this process uses both TFTP and BOOTP, the same TFTP parameters appear in the dialog box when Boot Source is set to either BOOTP server or Directed TFTP.

  In practice, the difference between using BOOTP and using Directed TFTP for router startup is that TFTP requires you to specify the IP address of a single server, and BOOTP does not. A router starts BOOTP transactions by broadcasting a request for the address of a BOOTP server. Any BOOTP server on the network can reply with its own address. The reply that reaches the router first determines which BOOTP server the router will use for that transaction. If an attempt to use BOOTP fails, the router attempts to use the firmware stored in Flash-EPROM. If the attempt to use BOOTP succeeds, the router stores the new firmware in Flash-EPROM for future use. Whether the attept to use BOOTP succeeds or fails, the Boot Source parameter reverts to Flash-EPROM.

```
┌─────────────────────────────────────┐
│ ═════════  Router Startup  ═════════ │
│  ┌──┐  PN657                         │
│  │◆ │  PN657 StarRouter              │
│  └──┘  0B-00017                      │
│        Firmware Version 1.0          │
│        Router IP Address: 192.100.87.74 │
│                                      │
│  Boot Source:   │ BOOTP Server ▼ │   │
│  ┌─────────────────────────────────┐ │
│  │ TFTP Retry Count:    │  20   │  │ │
│  │                                 │ │
│  │ TFTP Retry Period:   │ 20  │   │ │
│  │                                 │ │
│  │                                 │ │
│  │ BOOTP Retry Count:   │ 10  │   │ │
│  │                                 │ │
│  │ BOOTP Retry Period:  │ 20  │   │ │
│  └─────────────────────────────────┘ │
│                                      │
│     ☐ Revert To Factory Settings     │
│    [ Cancel ]  [ Set ]  [ Restart ]  │
└─────────────────────────────────────┘
```

□ **TFTP Retry Count:** This parameter governs how many communication attempts the router makes, if it cannot obtain its firmware from the BOOTP-and-TFTP server on the first request.

□ **TFTP Retry Period:** This parameter governs how long the router waits between attempts to communicate with the BOOTP-and-TFTP server, if there are communication difficulties. This parameter is displayed in 50 millisecond units (a value of 1 equals 50 milliseconds, a value of 20 equals 1 second). The maximum value is 32,767.

□ **BOOTP Retry Count:** This parameter governs how many communication attempts the router makes, while attempting to establish communication with the BOOTP-and-TFTP server.

□ **BOOTP Retry Period:** This parameter governs how long the router waits between attempts to communicate with the BOOTP-and-TFTP server, while attempting to establish communication. This parameter is displayed in 50 millisecond units (a value of 1 equals 50 milliseconds, a value of 20 equals 1 second). The maximum value is 32,767.

▶ **Note:** If your router is using IP only during cold resets where the boot source is a BOOTP-and-TFTP server, you do not need to use the IP Setup dialog to enable IP.

Revert To Factory Settings

This option governs which configuration settings a router uses during a cold reset: the configuration settings you have entered, or factory default settings. If the Revert To Factory Settings option is selected, the router will *permanently* discard your configuration information and use factory default settings at its next cold reset. This option is included to allow you to quickly reset *all* router and gateway parameters to a known state, if you ever wish to start the configuration process over from the beginning. This option is automatically deselected after each cold reset.

▶ **Important:** Leave Revert To Factory Settings deselected unless you want the router to discard all your configuration settings the next time it is reset.

Cancel

This button closes the Router Startup dialog box without saving any parameter changes.

Set

This button closes the Router Startup dialog box, retains parameter changes for use the next time the selected device is reset, and forces the next reset to be a cold reset.

Restart

This button is a shortcut for clicking the Set button and then choosing Reset Device—it retains parameter changes, causes the device to undergo a cold reset, and uses the retained parameters to complete the reset process.

Set Clock

Farallon hardware routers such as the StarRouter and the InterRoute/5 router contain internal clocks. The Set Clock command controls the time to which the clock of the selected router is set. The listings in each Router Event History are time-stamped according to the selected router's clock. To be ready to troubleshoot in the future, set the router clock to match your local time, so the times listed in the Router Event History will be meaningful.

To set the clock, click any part of the displayed date or time to highlight a value to change. Date is divided into month, day, and year; time is divided into hours, minutes, and seconds. Type in a new value or click the up or down arrow to increase or decrease the displayed value. Alternatively, you can set the router clock to match your Macintosh clock by simply clicking the Use Mac Clock button.

```
═══════════════ Set Clock ═══════════════
    PN657
    PN657 StarRouter          5/13/92
    OB-00017
    Firmware Version 1.0
                              5:27:53 PM


  [ Use Mac Clock ]      [ Cancel ]   (( Set ))
```
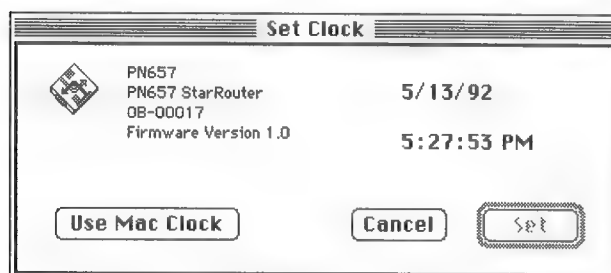
▶ **Note:** If you change the setting of the clock in your Macintosh computer while you are running StarCommand, the Set Clock dialog may not display an accurate reading for the clock on your Farallon hardware router. To correct this, close and re-open your StarCommand file.

IP Setup

This command controls the settings that allow your Farallon hardware router to use the Internet Protocol (IP).

▶ **Note:** The parameters in this dialog must be correctly set before you can use the Simple Network Management Protocol (SNMP), MacIP, IPTalk, or IP Tunnelling.

Enable IP

This option controls whether or not the selected Farallon hardware router can use the Internet Protocol (IP). You must select this checkbox if you intend to use MacIP, IPTalk, IP Tunnelling, or SNMP.

IP Address

If the selected Farallon hardware router is to communicate with devices using IP, it must have an IP address of its own. Type in a unique address that contains the IP network address used on the Ethernet network that connects to the router.

Broadcast Address

If the selected Farallon hardware router is to communicate with devices using IP, it must also know the correct IP broadcast address to use on the Ethernet network to which it is connected. You cannot enter this value directly; it is derived from the IP Address and the Broadcast Format parameters.

Broadcast Format

On IP networks, broadcast packets use IP destination addresses whose host portions are composed completely of zeroes or completely of binary ones. If the selected Farallon hardware router is to communicate with devices using IP, it must also know the correct broadcast format to use on that network. The choice between zeroes and ones depends on the age and type of IP computers you use. Determine whether your IP computers use all zeroes or all ones, and configure the router to use the same broadcast format.

Subnet Mask

If your IP network uses subnetting, you must select the Subnet Mask checkbox and specify the Subnet Mask used on your IP network. The subnet mask indicates which of the bits in an IP address are to be treated as network address information, and which are to be treated as host address information. For more information of subnet masks, see the user's guide provided with your Farallon hardware router.

Default Gateway

Your Farallon hardware router may occasionally receive packets with destinations whose IP addresses are unknown. You have the option of specifying the IP address of another device (called a default gateway) for the router to use as a destination for these unknown packets. If the default gateway has more extensive routing tables, it may be able to forward the packets to their destinations.

Packet Encapsulation

Your Farallon hardware router can send two different types of IP packets: those with Ethernet headers, and those with 802.3 headers. Select the type of packets your IP computers use.

Receive RIP

Your Farallon hardware routers can optionally send and receive Routing Information Protocol (RIP) packets, which are normally used by IP routers. (IP routers are devices that connect IP networks together and selectively retransmit IP packets between those networks.) If your internet does not contain IP routers, you need not use RIP. If you plan to use MacIP with IP Subnetting on LocalTalk as the IP Forwarding type, you must use Receive RIP and Transmit RIP unless your IP routers have hard-coded information about how to transmit to the subnet on your LocalTalk network. The Transmit RIP parameter appears in the MacIP Setup dialog box, discussed later in this chapter.

Cancel

This button closes the IP Setup dialog box without saving any parameter changes.

Set

This button closes the IP Setup dialog box and retains parameter changes for use when you reset the selected device.

MacIP Setup

This command controls the settings that allow your Farallon hardware router to act as a MacIP gateway. MacIP is a protocol that specifies how IP packets can travel over AppleTalk networks. Your Farallon hardware router provides you with a choice between two types of MacIP support: KIP Forwarding and IP Subnetting On LocalTalk, which are described below. You can also turn MacIP off. These three choices appear in the IP Forwarding pop-up menu.

IP Forwarding: ┌─────────────────────────────┐
              │ ✓MacIP Off   │
              │ KIP Forwarding   │
              │ IP Subnetting on LocalTalk │
              └─────────────────────────────┘
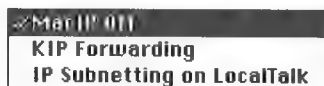
MacIP Off

MacIP Off disables the MacIP functionality of your Farallon hardware router until you choose another IP Forwarding type and reset the device.

KIP Forwarding

KIP Forwarding allows your MacIP clients to use IP addresses with the same IP network number as your IP network.

MacIP Setup dialog with KIP Forwarding chosen as IP Forwarding type

- **First MacIP Client Address:** This parameter specifies the start of your contiguous range of MacIP client IP addresses.

- **Maximum Addresses:** This parameter shows the maximum total number of MacIP clients the selected hardware router can support. The parameter is automatically determined by the type of hardware router and configuration you have, and is displayed for your information only.

- **Static Addresses:** This parameter allows you to specify how many MacIP client addresses will be permanently assigned to individual MacIP client machines. The range for static MacIP client addresses follows immediately after the First MacIP Client Address defined previously, and contains the exact number of static addresses you specify. This range is displayed for your information immediately below the Static Addresses parameter line.

■ **Dynamic Addresses:** This parameter allows you to specify how
many MacIP client addresses will be kept in a common pool
for temporary assignment to MacIP client machines. The range
for dynamic MacIP client addresses follows immediately after
the static addresses defined previously, and contains the
exact number of dynamic addresses you specify. This range is
displayed for your information immediately below the Dynamic
Addresses parameter line.

IP Subnetting On LocalTalk

IP Subnetting On LocalTalk allows your MacIP clients to use IP
addresses with a different IP network number or subnet number
than your IP network. You should only use IP network numbers
assigned to you by the Network Information Center (NIC).
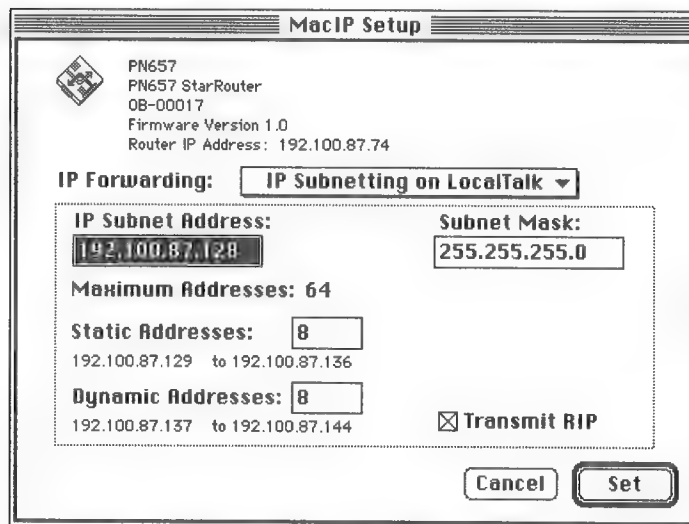
*MacIP Setup dialog with IP Subnetting On LocalTalk chosen as
IP Forwarding type*

■ **IP Subnet Address:** This parameter allows you to specify the
IP address of the selected hardware router for the IP subnet
on LocalTalk. (The device must have a separate IP address for
each IP network it serves, including your LocalTalk
"IP Subnet.") Your contiguous range of MacIP client IP
addresses starts immediately following this address.

■ **Maximum Addresses:** This parameter shows the maximum total number of MacIP clients the selected hardware router can support. The parameter is automatically determined by the type of hardware router and configuration you have, and is displayed for your information only.

■ **Static Addresses:** This parameter allows you to specify how many MacIP client addresses will be permanently assigned to individual MacIP client machines. The range for static MacIP client addresses follows immediately after the IP Subnet Address defined previously, and contains the exact number of static addresses you specify. This range is displayed for your information immediately below the Static Addresses parameter line.

■ **Dynamic Addresses:** This parameter allows you to specify how many MacIP client addresses will be kept in a common pool for temporary assignment to MacIP client machines. The range for dynamic MacIP client addresses follows immediately after the static addresses defined previously, and contains the exact number of dynamic addresses you specify. This range is displayed for your information immediately below the Dynamic Addresses parameter line.

■ **Subnet Mask:** This parameter allows you to specify the subnet mask used by your LocalTalk "IP Subnet." Normally, this subnet mask should match the subnet mask specified in the IP Setup dialog. For more information on subnets and subnet masks, see the user's guide for your Farallon hardware router.

■ **Transmit RIP:** Your Farallon hardware routers can optionally send and receive Routing Information Protocol (RIP) packets, which are normally used by IP routers. If your internet does not contain IP routers, you need not use RIP. If you plan to use MacIP with IP Subnetting on LocalTalk as the IP Forwarding type, you must use Receive RIP and Transmit RIP unless your IP routers have hard-coded information about how to transmit to the subnet on your LocalTalk network. The Receive RIP parameter appears in the IP Setup dialog box, discussed earlier in this chapter.

Cancel

This button closes the MacIP Setup dialog without saving any parameter changes.

Set

This button closes the MacIP Setup dialog and retains parameter changes for use when the selected device is reset.

IPTalk Setup

This command controls the settings that allow your Farallon hardware router to act as an IPTalk gateway. IPTalk is a protocol that specifies how AppleTalk packets can travel over IP networks.

Enable IPTalk

This parameter allows you to enable or disable the IPTalk gateway functionality of the selected Farallon hardware router. If the checkbox is not selected, other parameters in the IPTalk Setup dialog box are dimmed.

- **Network Number:** If you plan to send IPTalk packets over the Ethernet network that connects to the selected Farallon hardware router, you must assign that network a unique AppleTalk network number that will be used only for IPTalk traffic, not for EtherTalk traffic. Type the number you choose into the Network Number box.

- **Zone Name:** If you plan to send IPTalk packets over the Ethernet network that connects to the selected Farallon hardware router, you must also assign that network an AppleTalk zone name. Like LocalTalk networks and EtherTalk Phase 1 networks, each IPTalk network can have only one zone name, which can either be unique or be shared with other AppleTalk networks. Type the name you choose into the Zone Name box.

- **Use atalkad:** You may use IPTalk with or without atalkad, the AppleTalk Administration Daemon, a program that runs on IP computers called atalkad servers. Atalkad can provide some types of configuration information and routing information to various network devices, including Farallon hardware routers, whenever they reboot. Select the checkbox to use atalkad. If you use atalkad, you must type the IP address of your atalkad server into the atalkad address box, and must set up your atalkad server according to instructions provided with your atalkad software. The atalkad program is not included with Farallon hardware routers.

- **Router AppleTalk Node Number:** This parameter is displayed for your information only, to help you set up your IPTalk application software on one or more IP computers. It indicates the AppleTalk node number that the selected Farallon hardware router uses on the IPTalk network.

- **IP Net Number:** This parameter is displayed for your information only, to help you set up your IPTalk application software on one or more IP computers. It indicates the IP network number that is used for regular IP traffic on the Ethernet network that is connected to the selected Farallon hardware router.

- **Use NIC UDP Port Range:** When you set up an IPTalk software application on an IP computer, it includes a mechanism for mapping AppleTalk socket numbers into their approximate IP equivalents: UDP port numbers. Historically, two different mapping strategies have been used: an early strategy in which the mapped UDP port numbers start at 769, and a later strategy approved by NIC, in which the mapped UDP port numbers start at 201. Click the checkbox to select the range that starts at 201. Use this range if your IPTalk software supports it.

Cancel

This button closes the IPTalk Setup dialog box without saving configuration changes.

Set

This button closes the IPTalk Setup dialog box and retains configuration changes for use the next time the selected hardware router is reset.

IP Tunnelling Setup

This command controls the settings that allow your Farallon hardware router to send packets between AppleTalk networks that are separated by one or more IP routers. Similar functionality can be obtained through using IPTalk and atalkad, but IP Tunnelling does not require an atalkad server and atalkatab network configuration file, as IPTalk does.

```
╔═══════════════ IP Tunnelling Setup ═══════════════╗
║                                                    ║
║   ◈   PN657                                        ║
║       PN657 StarRouter                             ║
║       0B-00017                                     ║
║       Firmware Version 1.0                         ║
║       Router IP Address:  192.100.87.74            ║
║       Default Gateway Address: disabled            ║
║                                                    ║
║   ⊠ Enable IP Tunnelling                           ║
║   IP Tunnel Gateway Addresses:                     ║
║   ┌──────────────────────────┐△  ┌──────────┐      ║
║   │ 137.14.92.3              │   │   Add    │      ║
║   │                          │   └──────────┘      ║
║   │                          │   ┌──────────┐      ║
║   │                          │   │  Change  │      ║
║   │                          │▽  └──────────┘      ║
║   └──────────────────────────┘   ┌──────────┐      ║
║   ┌──────────────────────────┐   │  Delete  │      ║
║   │ 199.178.19.42            │   └──────────┘      ║
║   └──────────────────────────┘                     ║
║                          ┌────────┐  ┌────────┐     ║
║                          │ Cancel │  │  Set   │     ║
║                          └────────┘  └────────┘     ║
╚════════════════════════════════════════════════════╝
```
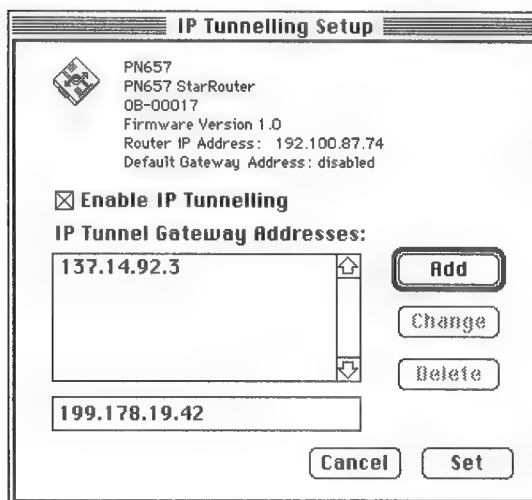
Enable IP Tunnelling

This parameter enables or disables the IP tunnelling functionality of the selected Farallon hardware router. Click the checkbox to select or deselect tunnelling functionality. Remember that you need at least two gateways that support tunnelling in order to use it.

IP Tunnel Gateway Addresses

You may enter IP addresses for up to 32 gateways that will communicate with the selected router via IP Tunnelling. For the tunnelling to work, each of the gateways listed must also be configured to know the IP address of router your are configuring.

■ **Add:** To add a gateway address, type it into the box below the scrolling list, and click the Add button or press Return.

■ **Change:** To change a gateway address in the scrolling list, select it and type the changed address in the box below the scrolling list, then click the Change button or press Return.

■ **Delete:** To delete a gateway address in the scrolling list, select it and click the Delete button.

Cancel
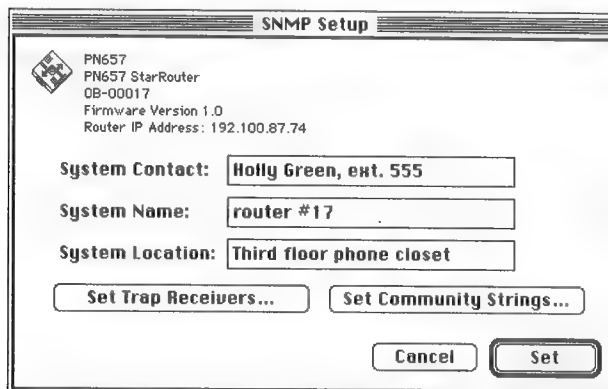
This button closes the IP Tunnelling Setup dialog box without saving configuration changes.

Set

This button closes the IP Tunnelling Setup dialog box and retains configuration changes for use the next time the selected hardware router is reset.

SNMP Setup

This command controls the settings that allow you to manage your Farallon hardware router using an SNMP network management application instead of StarCommand. SNMP stands for Simple Network Management Protocol.

The first three parameters in the dialog box, System Contact, System Name, and System Location, provide information to the user of an SNMP application, but do not affect the operation of the selected hardware router in any other way. Farallon recommends that you enter appropriate information, for the convenience of SNMP users, but this is optional.

System Contact provides you with a place to enter the name of the person responsible for managing and maintaining the hardware router, perhaps along with a phone number.

System Name provides you with a place to enter the name you use for the individual device, to distinguish it from other devices of the same type.

System Location provides you with a place to enter information about the physical location or organizational function of the device.

Set Trap Receivers

The Set Trap Receivers button brings up another dialog box, where you may enter the IP addresses of up to eight computers that should receive SNMP "Trap" (alert) messages from the hardware router. Each of these machines will expect a certain password-like series of characters to be included in any message from the hardware router. Each such character sequence is called a "Community String." You must specify the community string for the hardware router to use when alerting each of the computers that will receive trap messages.
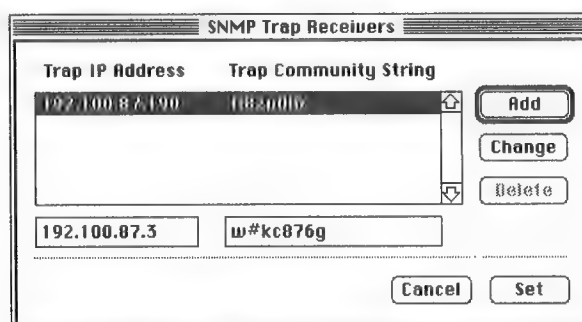
- **Add:** To add a Trap IP Address and Trap Community String, click in the left-hand box below the scrolling list, type the IP address, press Tab, type the community string in the right-hand box below the scrolling list, and click the Add button.

- **Change:** To change a Trap IP Address or a Trap Community String, select it in the scrolling list, type your changes in the boxes below the list, pressing Tab to switch between boxes, and then click the Change button.

- **Delete:** To delete a Trap IP Address and Trap Community String, select it in the scrolling list, then click the Delete button.

Set Community Strings

The Set Community Strings dialog box allows you to specify which password-like character sequences the selected hardware router will require in order to accept incoming SNMP requests. You can set two different community strings, to provide some users with the capability of changing the router's settings, while limiting others to simply gathering information from the router.
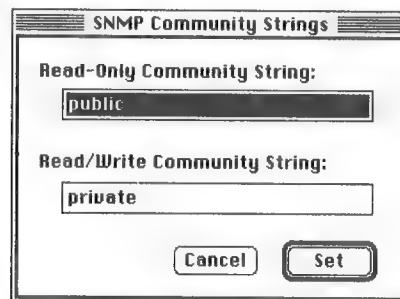
```
┌────────────────────────────────────┐
│ ▦▦▦▦   SNMP Community Strings   ▦▦▦▦│
│ ┌────────────────────────────────┐ │
│ │                                │ │
│ │ Read-Only Community String:    │ │
│ │ ┌────────────────────────────┐ │ │
│ │ │public                      │ │ │
│ │ └────────────────────────────┘ │ │
│ │                                │ │
│ │ Read/Write Community String:   │ │
│ │ ┌────────────────────────────┐ │ │
│ │ │private                     │ │ │
│ │ └────────────────────────────┘ │ │
│ │                                │ │
│ │        ( Cancel )  (( Set ))   │ │
│ └────────────────────────────────┘ │
└────────────────────────────────────┘
```

- **Read-Only Community String:** If an SNMP user includes this character sequence in packets sent to the selected StarRouter or InterRoute/5 router, the router will answer requests for information but will not allow itself to be reconfigured in any way.

- **Read/Write Community String:** If an SNMP user includes this character sequence in packets sent to the selected StarRouter or InterRoute/5 router, the router will answer requests for information and will also allow itself to be reconfigured.

Cancel

This button closes the SNMP Setup dialog box without saving configuration changes.

Set

This button closes the SNMP Setup dialog box and retains configuration changes for use the next time the selected hardware router is reset.

Show Routing Table

This command displays the routing table used by your Farallon hardware router, along with statistics related to its AppleTalk Routing activities. See Appendix A for an explanation of these statistics. See the "Routing Table" section of Chapter 2 for an explanation of the routing table data displayed in this window.

Click this flag to display all zone names for EtherTalk Phase 2.

Zone Name	Net Number	State	Hops	Router Port	Net.Node Number	Cumulative Traffic Received as of 1:36 PM 6/15/92 Percent	Packets
EtherTalk Phase 2	20 – 23	Good	0	ET Ph 2	20.150	0	0
LocalTalk 1	1001	Good	1	ET Ph.2	20.151	0	0
LocalTalk 2	1002	Good	1	ET Ph.2	20.151	0	0
LocalTalk 3	1003	Good	1	ET Ph 2	20.151	0	0
LocalTalk 4	1004	Good	1	ET Ph.2	20.151	0	0
LocalTalk StarRtr	59372	Good	0	LT	59372.128	100	6

Routing Table header:

StarRouter
PN657 StarRouter
0B-00017
Firmware Version 1.0

BrRqs In = 60
Rtmp/Zips = 346
Rx Errors = 0
No Buffer = 0
HopOvrFlo = 0
Bad Cksum = 0

LkUps Out = 60
Pkts Frwd = 0
Tx Errors = 0
Inval Prt = 0
Inval Net = 0
Filtered = 0

Save...
Clear

Save

The Save button allows you to save the data in the Routing Table (including the routing statistics) to a tab-delimited text file.

Clear

The Clear button allows you to reset the statistics counters that are displayed in the Routing Table header.

Show Router Event History

This command displays a list of up to 128 of the most recent events that the selected Farallon hardware router has recorded. The list of events begins when the router first becomes operational, but it is cleared whenever the router is reset to default factory settings or the Clear Router Event History command is used.
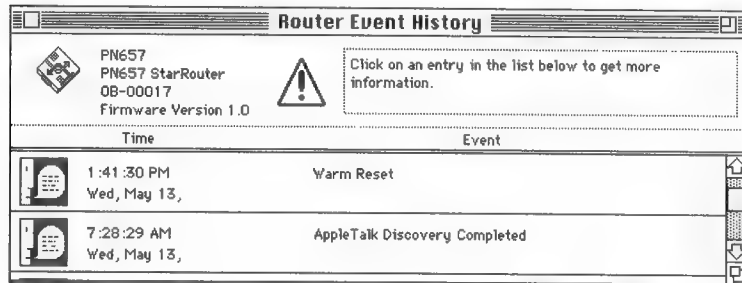
Clear Router Event History

This command clears the list of up to 128 of the most recent events that the selected Farallon hardware router has recorded.

Export Router Event History

Displays a directory dialog box to save the entries in the Router Event History records to a tab-delimited text file. You can later open the text file with a spreadsheet or word processing application.

Appendix A

Statistics

StarCommand reports statistics for LocalTalk and Ethernet devices in the Device Info and Port Info windows. A few statistics are also available through the use of pop-up menus in the Device List and Port List windows. This appendix provides information on all the statistics displayed in StarCommand.

Each model of a hub, router, or Interface Module has a different set of statistics counters. The tables on the following pages show which counters each model supports.

▶ **Note:** Repeater statistics indicate traffic received by the repeater, unless explicitly noted otherwise. Any byte received through one repeater port (say, port 3) is transmitted through all the other repeater ports that are enabled (say, ports 1, 2, and 4 through 12). Thus, the number of bytes that are transmitted will be a multiple of the number of bytes received, according to this formula:

Bytes Transmitted = Bytes Received x (Number of Enabled Ports - 1)

Device Model

Counters	207	307	357, 377	407	507	657	701
Alignment Errors					√	√	
AUI or BP Collisions					√		
AUI or BP Total Errors					√		
AUI or BP Traffic (Bytes)					√		
AUI or BP Traffic (Packets)					√		
Autopartitions					√		
Bad CkSum						√	
BrRqs In						√	
Carrier Errors						√	
EN Bytes Received						√	
EN Bytes Sent						√	
EN Collisions							√
EN Multiple Collisions						√	
EN Packets Received						√	
EN Packets Sent						√	
EN Repeater Traffic (Bytes)				√ *	√		
EN Repeater Traffic (Pkts)				√ *	√		
EN Single Collisions						√	
EN Total Collisions					√		
EN Total Errors				√	√		
EN Total Receive Errors						√	
EN Total Send Errors						√	
EN Traffic (Bytes)							√
EN Traffic (Packets)							√
Errors		√	√		√	√	
Excessive Retries						√	
FCS (Frame Check Sequence) Errors					√	√	
Filtered						√	
Fragments		√	√		√	√	
Frame Errors					√		
HopOvrFlo						√	
Inval Prt						√	
Inval Net						√	

* Statistics are estimated and averaged. Individual port statistics are not available.

Device Model

Counters	207	307	357, 377	407	507	657	701
Jabbers					√		
Jams		√	√				
Late Collisions					√	√	
Link Errors					√		
LkUps Out						√	
Long Packets					√		
LT Mgmt Traffic (Bytes)			√				
LT Mgmt Traffic (Packets)			√				
LT Repeater Traffic (Bytes)	√ *	√	√				
LT Repeater Traffic (Packets)		√	√				
LT Total Errors		√	√			√	
LT Traffic (Bytes)						√	
LT Traffic (Packets)						√	
No Buffer						√	
Noise Jams						√	
Num. Devices in Concentrator							√
Other Receive Errors						√	
Other Send Errors						√	
Out of Spec Freq					√		
Overflow Errors						√	
Pkts Frwd						√	
Repeater Errors		√	√	√	√	√	
Repeater Traffic (Bytes)		√	√	√ *	√	√	
Router LT Traffic (Bytes)						√	
Router LT Traffic (Packets)						√	
Rtmp/Zips						√	
Run-On Jams						√	
Rx Errors						√	
SFD (Start Frame Delimeter) Errors					√		
Short Packets					√		
Total Port Errors					√		
Traffic (Bytes)		√	√		√	√	
Traffic (Packets)		√	√		√	√	
Tx Errors						√	

* Statistics are estimated and averaged. Individual port statistics are not available.

Alphabetical listing of counters

Alignment Errors: Packets containing a number of bits that is not a multiple of eight. Displayed for individual Ethernet repeater ports and AUI ports on repeaters or routers. The value of this counter should be zero. Alignment errors may indicate a hardware problem with a hub or an Ethernet controller card, electrical interference, or faulty cabling. (Ethernet only.)

AUI or BP Collisions: A collision occurs when two or more devices transmit at the same time. AUI indicates that the collision signal was detected through the DB-15 AUI port of a Farallon hardware router; BP indicates that the collision signal was detected through the router's connection to a Farallon Concentrator backplane Ethernet network. It is normal to have about one collision for every thousand packets transmitted. A collision rate of one in ten, however, indicates a serious problem. (Ethernet only.)

AUI or BP Total Errors: The sum of all the errors a Farallon hardware router receives through its DB-15 AUI connection or Farallon Concentrator backplane (BP) connection to an Ethernet network. (Ethernet only.)

AUI or BP Traffic (Bytes): The number of bytes an Ethernet hub receives through its DB-15 AUI connection or Farallon Concentrator backplane (BP) connection. This counter does not include length errors, alignment errors, or frame check sequence errors. (Ethernet only.)

AUI or BP Traffic (Packets): The number of packets an Ethernet hub receives through its DB-15 AUI connection or Farallon Concentrator backplane (BP) connection. This counter does not include length errors, alignment errors, or frame check sequence errors. (Ethernet only.)

Autopartitions: The number of times an Ethernet port has temporarily shut off due to collisions or jabbers. A port is shut off when the device detects 32 consecutive collisions or when a signal continues for more than 5 milliseconds. The port is reactivated automatically when a packet of the proper length arrives without experiencing a collision. (Ethernet only.)

Bad CkSum: The number of packets sent incorrectly or corrupted while passing through an intermediary router, as shown by their invalid DdpLong checksums.

BrRqs In: The number of NBP Broadcast Requests a router has received. (LocalTalk, EtherTalk, or IPTalk.)

Carrier Errors: Number of times the router detected an interruption of Ethernet communications. Could indicate that the router is physically disconnected from the Ethernet. (Ethernet only.)

EN Bytes Received: The number of bytes a Farallon hardware router has received through its Ethernet port.

EN Bytes Sent: The number of bytes a Farallon hardware router has transmitted through its Ethernet port.

EN Collisions: A collision occurs when two or more devices transmit at the same time. This counter records the collisions detected by the Farallon Concentrator Interface Module. Separate counts are kept for the two Ethernet buses in the Concentrator, and are displayed as EN1 Collisions and EN2 Collisions. It is normal to have about one collision for every thousand packets transmitted. A collision rate of one in ten, however, indicates a serious problem.

EN Multiple Collisions: The number of Ethernet packets a Farallon hardware router has had to re-transmit more than once, but less than 16 times, due to collisions.

EN Packets Received: The number of packets a Farallon hardware router has received through its Ethernet port.

EN Packets Sent: The number of packets a Farallon hardware router has transmitted through its Ethernet port.

EN Repeater Traffic (Bytes): The number of bytes amplified and repeated over Ethernet repeater ports 1–12. This counter does not include length errors, alignment errors, or frame check sequence errors.

EN Repeater Traffic (Pkts): The number of bytes amplified and repeated over Ethernet repeater ports 1–12. This counter does not include length errors, alignment errors, or frame check sequence errors.

EN Single Collisions: The number of Ethernet packets a Farallon hardware router has had to re-transmit exactly once, due to collisions.

EN Total Collisions: A collision occurs when two or more devices transmit at the same time. This counter records the total number of collisions detected for Ethernet repeater ports 1–12. It is normal to have about one collision for every thousand packets transmitted. A collision rate of one in ten, however, indicates a serious problem. (Ethernet only.)

EN Total Errors: The sum of all Ethernet errors received by an Ethernet repeater.

EN Total Receive Errors: The sum of all errors received by the Ethernet port of a Farallon hardware router.

EN Total Send Errors: The sum of all errors sent by a Farallon hardware router.

EN Traffic (Bytes): The number of bytes received by the Farallon Concentrator Interface Module. Depending on which Concentrator Ethernet buses you are using, this may be displayed as EN1 or EN2 Traffic (Bytes).

EN Traffic (Packets): The number of packets received by the Farallon Concentrator Interface Module. Depending on which Concentrator Ethernet busses you are using, this may be displayed as EN1 or EN2 Traffic (Packets).

Errors: The sum of all errors for a repeater port.

Excessive Retries: The number of times a packet was not transmitted because there were collisions on 16 successive transmission attempts. (Ethernet only.)

FCS (Frame Check Sequence) Errors: Packets that contain a number of bits that is a multiple of eight but that do not pass the frame check sequence. The frame check sequence is a data integrity verification and is also known as a Cyclical Redundancy Check (CRC). Displayed for individual Ethernet repeater ports and AUI ports on repeaters or routers. This may be caused by bad cable connections, electrical interference from high-voltage equipment, or a faulty network interface card. (Ethernet only.)

Filtered: The number of packets not forwarded from a "hidden" network or duplicating a packet already queued for transmission.

Fragments: Ethernet packets that contain less than 12 bytes, or LocalTalk packets that contain less than 56 bits. On LocalTalk repeater ports, when the port interconnect setting is off, a port is auto-partitioned when 12 consecutive fragments are received within 100 milliseconds. With port interconnect on, a LocalTalk repeater port is never auto-partitioned for fragments. Fragments can be caused by collisions, by electrical interference with signals on the network wiring, or by physically plugging or unplugging a network connection. (LocalTalk or Ethernet.)

Frame Errors: The total of all CRC errors, short frames, long frames, runts, and alignment errors for Ethernet repeater ports 1–12. (Ethernet only.)

HopOvrFlo: The number of packets whose hop counts, or distance factors, exceeded the maximum limit of 15. (LocalTalk, EtherTalk, or IPTalk.)

Inval Net: The number of packets destined for an unknown network. (LocalTalk, EtherTalk, or IPTalk.)

Inval Prt: The number of packets destined for a disabled or otherwise invalid port. (LocalTalk, EtherTalk, or IPTalk.)

Jabbers: When a port receives a packet that exceeds 5 milliseconds in duration, the port discontinues reception and transmission of the packet. The Jabbers counter shows the number of times this occurred on an Ethernet repeater port. May indicate that you have a serious problem with a transceiver or Ethernet node. Displayed for individual Ethernet repeater ports, including AUI or backplane (BP) ports on repeaters. (Ethernet only.)

Jams: A jam is an excessively long LocalTalk packet transmission. With the port interconnect setting off, a LocalTalk repeater port is auto-partitioned and a jam is reported when any packet longer than 50 milliseconds is received. With port interconnect on, a port is auto-partitioned and a jam is reported when a packet longer than 250 milliseconds is received. (LocalTalk only.)

Late Collisions: Collisions that occur later than 64 bytes into a transmitted packet. Late Collisions are not included in the Collisions count. Displayed for individual Ethernet repeater ports and AUI ports on repeaters or routers. May indicate too many repeaters on a backbone, branch cables that are too long, or a faulty network interface card. (Ethernet only.)

Link Errors: Total of all jabbers, autopartitions, and start frame delimiter errors for Ethernet repeater ports 1–12. (Ethernet only.)

LkUps Out: The number of NBP Lookups sent from a router, including the derivatives of BrRqs In. (LocalTalk, EtherTalk, or IPTalk.)

Long Packets: The number of packets an Ethernet repeater receives that contain more than 1,518 bytes but are less than 5 milliseconds in duration. Displayed for individual Ethernet repeater ports, including AUI or backplane (BP) repeater ports. The value of this counter should be zero. Long packets may indicate a software malfunction involving the driver. (Ethernet only.)

LT Mgmt Traffic (Bytes): The number of LocalTalk bytes an extended management hub generates, itself, during in-band StarCommand management sessions.

LT Mgmt Traffic (Packets): The number of LocalTalk packets an extended management hub generates, itself, during in-band StarCommand management sessions.

LT Repeater Traffic (Bytes): The total traffic activity in bytes for the ports on a LocalTalk repeater. This total includes statistics only for those ports with the port interconnect setting switched off.

LT Repeater Traffic (Packets): The total traffic activity in packets for the ports on a LocalTalk repeater. This total includes statistics only for those ports with the port interconnect setting switched off.

LT Total Errors: The sum of all fragments and jams received by a LocalTalk repeater or the LocalTalk port of a router.

LT Traffic (Bytes): The total number of LocalTalk bytes received by a device. For the StarRouter, this includes traffic received from the LocalTalk repeater ports plus all traffic routed to LocalTalk.

LT Traffic (Packets): The total number of LocalTalk packets received by a device. For the StarRouter, this includes traffic received from the LocalTalk repeater ports plus all traffic routed to LocalTalk.

No Buffer: The number of times a router could not accept a packet (usually for forwarding) because all its buffers were allocated.

Noise Jams: The number of times a StarRouter repeater port was auto-partitioned because of too many fragments in a given time period. (LocalTalk only.) The sum of Noise Jams and Run-On Jams for a StarRouter repeater port is equivalent to Jams for a LocalTalk StarController repeater port.

Num. Devices in Concentrator: The number of hub or router modules installed within a single Farallon Concentrator. The Concentrator Interface Module is not counted in this statistic.

Other Receive Errors: The number of Ethernet controller chip receive buffer errors detected by a StarRouter. When the StarRouter is operating correctly, the value of this statistic should be zero.

Other Send Errors: The number of Ethernet controller transmit buffer and memory underflow errors detected by a StarRouter. When the StarRouter is operating correctly, the value of this statistic should be zero.

Out of Spec Freq: Ethernet packets that have a transmission frequency (data rate) that is so far from the standard specification that the packet cannot be received reliably. The 10BASE-T specification allows deviations of ±1000 bits per second. Displayed for individual Ethernet repeater ports and AUI ports. (Ethernet only.)

Overflow Errors: Number of times incoming Ethernet traffic exceeded a router's ability to process packets, and a packet was lost. Includes circumstances where the Ethernet controller did not receive a packet (missed packets), where no buffers were available, and where there was insufficient memory to process the packet. (Ethernet only.)

Pkts Frwd: The number of packets forwarded by a router from the source network to another network. (LocalTalk, EtherTalk, or IPTalk.)

Repeater Errors: The sum of all fragments and jams received by a LocalTalk repeating hub, or the sum of all errors received by an Ethernet repeating hub.

Repeater Traffic (Bytes): The total traffic activity in bytes for the ports on a repeating hub. This total includes statistics only for those ports with the port interconnect setting switched off. Management bus traffic does not affect this counter. You can see the traffic as a percentage of available bandwidth by displaying the Traffic counter in the Device List or Port List. Includes AppleTalk management traffic bytes for extended management devices.

Router LT Traffic (Bytes): The number of LocalTalk bytes transmitted by a device's LocalTalk router port. Includes NBP Lookups and management traffic transmitted to LocalTalk, as well as traffic routed to LocalTalk from EtherTalk networks, and LocalTalk traffic the router generates when MacIP, IPTalk, or IP Tunnelling are in use.

Router LT Traffic (Packets): The number of LocalTalk packets transmitted by a device's LocalTalk router port. Includes NBP Lookups and management traffic transmitted to LocalTalk, as well as packets routed to LocalTalk from EtherTalk networks, and LocalTalk packets the router generates when MacIP, IPTalk, or IP Tunnelling are in use.

Rtmp/Zips: The number of router maintenance packets (such as RTMP and ZIP packets) a router receives. (LocalTalk, EtherTalk, or IPTalk.)

Run-On Jams: Excessively long LocalTalk packet transmissions. With the port interconnect setting off, a LocalTalk repeater port is auto-partitioned and a run-on jam is reported when any packet longer than 50 milliseconds is received. With port interconnect on, a port is auto-partitioned and a run-on jam is reported when a packet longer than 250 milliseconds is received. The sum of Noise Jams and Run-On Jams for a StarRouter repeater port is equivalent to Jams for a LocalTalk StarController repeater port. (LocalTalk only.)

Rx Errors: The number of packets that encountered an error while being received by the Farallon router elements of the AppleTalk protocol stack. This statistic does not include packets aborted by higher level services. (LocalTalk, EtherTalk, or IPTalk.)

SFD (Start Frame Delimiter) Errors: The number of Ethernet packets an Ethernet repeater receives that contain a double zero before the start frame delimiter (double one). Usually indicates wiring that has polarity reversed. Displayed for individual Ethernet repeater ports and AUI ports of repeaters. (Ethernet only.)

Short Packets: Ethernet packets that contain a correct preamble (double one) but are less than 64 bytes. Short frames are also known as runts. Displayed for individual Ethernet repeater ports and AUI ports. It is normal to have some short packets, however, they may indicate improper termination of your network. (Ethernet only.)

Total Port Errors: Sum of all errors for an Ethernet repeater port.

Traffic (Bytes): The approximate number of bytes repeated through each port of a repeating hub. Includes AppleTalk management traffic bytes for extended management devices. Does not include length errors, alignment errors, or frame check sequence errors for Ethernet hubs. (LocalTalk and Ethernet.)

Traffic (Packets): The approximate number of packets repeated through each port of a repeating hub. Includes AppleTalk management traffic bytes for extended management devices. Does not include length errors, alignment errors, or frame check sequence errors for Ethernet hubs. (LocalTalk and Ethernet.)

Tx Errors: The number of packets the router failed to transmit due to a transmission error. (LocalTalk, EtherTalk, or IPTalk.)

Appendix B

Power User Tips

Maintaining the fastest response time in StarCommand

■ Keep the number of open windows to a minimum.

■ If network traffic is high, or if you must go through a router to reach an extended management device via AppleTalk, run StarCommand through a direct management bus connection, instead.

■ Deselect any unused connections in the Set Preferences dialog box.

■ Select only those zones that have extended management devices when running over AppleTalk.

■ Select wide area network zones only when necessary.

■ Use the Omit Device command to omit devices that don't require monitoring at the present time.

■ In the Finder, select StarCommand and use the Get Info command to set the Application Memory Size to an appropriate value for your network. StarCommand requires a minimum of 768K of available RAM. Farallon recommends that you use 1500K, or 600K plus 15K per hub or router for large networks.

Avoid running multiple copies of StarCommand

Avoid running StarCommand from two or more computers on the same network at the same time. This can lead to slow response times and unpredictable results.

AppleTalk active

If you are running StarCommand over the management bus and would like to view AppleTalk information, be sure AppleTalk is active on your computer. To do this, open the Chooser and select the appropriate radio button.

Address 0.0.0

Address 0.0.0 appears in the Device Info window if StarCommand is communicating with an extended management device via the management bus but not via AppleTalk. If your preferences are set to search over AppleTalk, and if your management gateway can communicate with the selected device via AppleTalk, the correct address will eventually be obtained. To display it, close the Device Info window that shows an address of 0.0.0, wait a few moments, and select the Device Info command again.

Appendix T

Farallon Technical Support

Farallon Computing is committed to providing its customers with reliable products and documentation, backed up with excellent technical support.

Before calling Farallon

Look in this user's guide for a solution to your problem. You may find a solution in Appendix B, "Power User Tips," "Problems Encountered when Learning StarCommand" in Chapter 1, or in other sections. Check the index for a reference to the topic of concern. If you are unable to locate the information you need, please gather the answers to the following Environment Profile questions *before* you call. Having this information ready helps speed up the process of resolving your problem.

Environment Profile

Before calling Farallon, gather the following information:

- Record the version number of the StarCommand software you are using. (Run the software and select About StarCommand from the Apple menu; or look at the label on the disk if the software is not functional.)

   StarCommand version number _____

- On what kind of Macintosh do you encounter the problem (for example, an SE or a IIsi)? (In the Finder, select About This Macintosh from the Apple menu.)

   Macintosh _____

- Which System version are you running (for example, 6.0.7 or 7.0)? (In the Finder, select About This Macintosh from the Apple menu.)

   System Software _____

- How much memory (RAM) is on your Macintosh? (In the Finder, select About This Macintosh from the Apple menu.)

   Total Memory (RAM) _____

- What sort of video display (external monitor) and adapter type is on your Macintosh?

   _____

■ What INITs (System Extensions) and Control Panels (CDEVs), other than Apple standards, are installed on your System?

_____

_____

_____

■ What kind of network(s) do you have?

☐ LocalTalk, daisy chain

☐ LocalTalk, bus (backbone)

☐ LocalTalk, passive star

☐ LocalTalk, active star

☐ Ethernet, twisted pair

☐ Ethernet, thin coax

☐ Ethernet, thick coax

☐ Other: _____

How to reach us

We can help you with your problem more effectively if you have completed the Environment Profile in the previous section and are at the site of the problem, prepared to reproduce it and to try some troubleshooting steps.

When you are prepared, contact Farallon Customer Service by telephone, fax, or mail at:

> Phone: (510) 596-9000
> Fax: (510) 596-9023
>
> Farallon Computing
> Customer Service
> 2000 Powell Street, Suite 600
> Emeryville, California 94608
> USA

You can also contact us via the following network services:

> America Online (ID: FARALLON)
> AppleLink (ID: FARALLON)
> CompuServe (ID: 75410,2702)
> Internet (ID: farallon@farallon.com)

Product information and technical notes can be found in the Farallon bulletin boards on America Online and AppleLink, on CompuServe in Macintosh Vendor C Forum, and on Internet via anonymous FTP to farallon.com (192.100.87.10).

If you are located outside of the United States and Canada, you can get service locally by contacting your nearest Farallon reseller or distributor. For a worldwide list of our distributors, see our AppleLink bulletin board or contact Farallon directly.

Glossary

alert icon: An icon that appears alongside a device or port indicating that a network event has been recorded in the Session Event Log.

AppleTalk: A comprehensive network system designed and developed by Apple Computer, Inc. AppleTalk allows many different types of computer systems, printers, and servers to communicate on a variety of cabling schemes, including LocalTalk and Ethernet cabling.

AppleTalk address: A unique identifier for each device using AppleTalk, to allow information to be sent and received correctly. An AppleTalk address always includes a node number and socket number, and includes a network number wherever two or more AppleTalk networks are connected together by routers.

AppleTalk information: The node name, type, zone, and network address of a device. An extended management device can read AppleTalk information for the devices attached to each of its ports.

atalkad (AppleTalk Administration Daemon): Software that runs on a computer using the UNIX operating system, designed to allow individual AppleTalk–IP gateways to acquire configuration and routing information from a centrally stored and managed file.

atalkatab (AppleTalk Administration Table): A specially formatted ASCII file stored on a computer using the UNIX operating system, in which the network manager specifies the routing and configuration information that atalkad provides to AppleTalk–IP gateways.

BOOTP (Boot Protocol): A protocol that allows an IP node "client" to obtain its IP address from an IP computer acting as a BOOTP server, along with the name of the file on the server containing the client's firmware and configuration information. BOOTP is normally used as a way of centralizing the administration of IP addresses. **TFTP** is usually used to transfer the firmware and configuration file from the server to the client.

BOOTP server: An IP computer that is specially configured to provide configuration information to devices that request it using the BOOTP protocol.

CAP (Columbia AppleTalk Package): Public-domain AppleTalk software for computers using the UNIX operating system. CAP allows UNIX computers to serve as AppleTalk Filing Protocol (AFP) file servers, provide print spooling services to AppleTalk computers, or print to AppleTalk printers. Requires the services of an AppleTalk–IP gateway that supports the IPTalk protocol.

community strings: Sequences of characters that serve much like passwords for devices using SNMP. Different community strings may be used to allow an SNMP user to gather device information or change device configurations.

Concentrator: *See* **Farallon Concentrator**.

device: In this manual, "device" means electronic equipment used in computing, usually a router, repeating hub, or Concentrator Interface Module.

device password: A password assigned to an extended management device. Any StarCommand user can obtain information about a password-protected device, but must enter the correct password in order to gain access to device settings and controls.

Ethernet: A networking protocol that defines a type of local area network characterized by a 10–megabit-per-second data rate, which can transmit large files much faster than LocalTalk. Ethernet is used in many mainframe, PC, and UNIX networks, as well as for EtherTalk.

EtherTalk: Apple's data-link software that allows an AppleTalk network to be connected by Ethernet cables. EtherTalk is a protocol within the AppleTalk protocol set. Two versions of EtherTalk are in common use, designated as Phase 1 and Phase 2 EtherTalk.

extended management device: A device that has a node name and address, and can be controlled over AppleTalk. Extended management devices include StarController 357 and 377 hubs, StarRouters, InterRoute/5 routers, and Interface Modules installed in Farallon Concentrators.

extended network: A network using AppleTalk Phase 2 protocols; EtherTalk 2.0 and TokenTalk are extended networks. LocalTalk networks are compatible with Phase 2 but are not extended because a single LocalTalk network cannot have multiple network numbers or multiple zone names.

Farallon Concentrator: A device designed to simplify installation and maintenance of Farallon hubs and hardware routers. Provides a compact enclosure for up to ten hubs or routers, with built-in circuitry for Ethernet and LocalTalk connections between devices.

file password: A password assigned to a StarCommand file.

firmware: Software stored in a device's memory that controls the device. The firmware on an extended management device can be reprogrammed.

firmware program file: A file provided by Farallon that contains new firmware for an extended management device.

gateway: A device that connects two or more networks that use different protocols. Gateways provide address translation services, but do not translate data. Gateways must be used in conjunction with special software packages that allow computers to use networking protocols not originally designed for them.

hub: A multi-port repeater.

in-band management: The capability of managing networking devices, such as hubs and routers, via a regular network connection, rather than special management wiring.

Interface Module: A device used in a Farallon Concentrator that provides management gateway services, management port connections, Ethernet transceivers, and Ethernet statistics.

internet: A set of networks connected together by routers. Also known as an **internetwork**.

InterRoute/5 router: A device from Farallon that provides LocalTalk–EtherTalk routing services for up to four LocalTalk networks and one EtherTalk network, as well as AppleTalk–IP gateway services.

IP (Internet Protocol): A networking protocol developed many years prior to AppleTalk, for use on computer systems that use the UNIX operating System. Often used with Ethernet cabling systems. In this manual, "IP" is used as an umbrella term to cover all packets and networking operations that include the use of the Internet Protocol.

IPTalk: A special AppleTalk–IP gateway protocol that allows AppleTalk packets to be transmitted over IP networks. Used with atalkad to provide communication paths between CAP nodes and AppleTalk networks separated by one or more IP-only routers, or between similarly separated AppleTalk networks. Not currently compatible with extended networks. *See also* **CAP**.

IP Tunnelling: A special AppleTalk–IP gateway protocol that allows communication between AppleTalk networks that are separated by one or more IP-only routers. Compatible with EtherTalk Phase 2, unlike IPTalk, which can provide similar functionality for non-extended networks. Sometimes called Cayman tunnelling.

jammed port: A port that is temporarily switched off because it is receiving an excessively long packet transmission.

link integrity: A setting that controls a port's link integrity test. This setting applies to 10BASE-T Ethernet hubs and transceivers only.

LocalTalk: The cabling specification for AppleTalk running at 230.4 kilobits per second.

MacIP: A special AppleTalk–IP gateway protocol that allows IP packets to be transmitted over AppleTalk networks. MacIP is frequently used to allow AppleTalk computers to function as terminals for computers using the UNIX operating system.

management bus: A pair of wires running between the management ports on networking devices. The management signals are carried over these wires.

management cable: A cable with an RJ-45 connector at one end and a DIN-8 connector at the other. This cable is used to directly attach the management port on a device to the modem or printer port on the network manager's Macintosh.

model number: A number that identifies a device, such as PN207, PN307, or PN507.

network event: Noteworthy occurrences on the network that are reported by StarCommand. A jammed port or disconnected device are two examples of network events.

network number: A unique number for each network in an internet. AppleTalk network numbers are assigned by seed routers, to which the network is directly connected; an isolated AppleTalk network does not need a network number.

network range: A unique set of contiguous numbers associated with an extended network; each number in a network range can be associated with up to 253 node addresses.

node: A single, addressable electronic machine on a network. Computers, networked printers, and routers are always nodes. Repeaters that allow in-band management are also nodes. Repeaters that only allow out-of-band management are not nodes.

node name: The AppleTalk node name assigned to an extended management device.

Notification Manager: An alert mechanism in the Macintosh System software. Notification Manager allows a StarCommand session running in the background to inform you if a network event occurs. StarCommand does this by flashing a miniature hub icon over the Apple icon.

older hub: A device that does not have an AppleTalk node name or address and is transparent to the network. The StarController 207, 307, 407, and 507 are older hubs and can be managed through the management bus only.

port interconnect: A setting that controls a repeater port's tolerance to fragments and jams. This setting applies to LocalTalk hubs only, and is used to permit two or more LocalTalk hubs to be interconnected without the use of routers.

protocol: A set of rules for communication. Such a set of rules may be made up of several smaller sets of rules, also called protocols. AppleTalk is a protocol that includes the LocalTalk, EtherTalk, and TokenTalk protocols.

repeater: A device that rebroadcasts a network signal, allowing it to travel for longer distances. Repeaters have little or no effect on the speed of a network signal.

repeater port: The connection point between a repeater and a network cable. Repeaters that have more than two ports are often called hubs.

router: A device that intelligently connects networks to each other. A router can connect identical network types, such as LocalTalk to LocalTalk, or dissimilar network types, such as LocalTalk to Ethernet. However, a common protocol, such as AppleTalk, must be used over both networks. A router forwards only the traffic that has a destination outside of the sender's immediate network. The forwarding route may include several routers, each forwarding the data to the next. Routers may be specially designed devices dedicated to routing, or they may be computers equipped with multiple network connections and special routing software.

Router Event History: A list of up to 128 network events that directly affected a certain Farallon hardware router, stored in that router's memory.

router port: A physical or logical connection between a router and a network. Where a network only allows the use of one protocol, each physical connection corresponds to one logical router port. Where a network allows the use of several protocols, each physical connection may correspond to several logical router ports—one for each protocol used. Each router port has its own network address.

routing table: A list of networks maintained by each router on an internetwork; information in the routing table helps the router determine the next router to forward packets to.

search indicator: An icon in the Device List that rotates when StarCommand searches for devices.

Session Event Log: The window that stores a history of network events.

SNMP (Simple Network Management Protocol): A protocol used for communication between management software packages and network devices. At the present time, SNMP is primarily used on IP networks.

SNMP console: A special device or IP computer used to manage network devices using SNMP.

StarCommand file: A file created by StarCommand that contains names, comments, preferences, sort order, passwords, and other information.

StarController hub: A multi-port repeater for Ethernet or LocalTalk networks. A StarController provides branch isolation, error-rate reduction, fault isolation, and continuous monitoring for jams.

StarRouter: An extended management device that combines a 12-port LocalTalk repeater with a two-port LocalTalk–EtherTalk router and an AppleTalk–IP gateway.

statistics: Fields that show traffic and error counts. See Appendix A for more information about each field.

subnet mask: A 32-bit number that indicates which bits in a 32-bit IP address designate the network address, as distinguished from the host or node address. When written in binary notation, each bit written as 1 corresponds to 1 bit of network address information. One subnet mask applies to all IP devices on an individual IP network.

TFTP (Trivial File Transfer Protocol): A set of rules that allow a device using the Internet Protocol (IP) to request a file transfer from a computer using the UNIX operating system. TFTP may be used to transfer new firmware from UNIX computers to Farallon hardware routers.

TFTP server: A computer using the UNIX operating system that is specially configured to provide file transfer services to devices that request it using the TFTP protocol.

zone: An arbitrary subset of nodes within an AppleTalk internet. Creating multiple zones makes it easier for users to locate network services. The network manager defines zones when he or she configures routers. Isolated networks have no zones. LocalTalk and EtherTalk Phase 1 networks may have no more than one zone each. EtherTalk Phase 2 and TokenTalk networks may have more than one zone each. Several networks of any AppleTalk type may share a zone name.

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